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Original Articles.

THE REGISTRATION OF VITAL STATISTICS IN THE UNITED STATES.

WHAT THE CENSUS BUREAU IS DOING TO IMPROVE IT.*

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The study of the development of registration methods in this country and of their relation to other branches of public health work will be an interesting part of the labors of the future historian of sanitary science. It is generally accepted as a fact that accurate vital statistics are absolutely indispensable to a satisfactory public health administration, and accordingly state and municipal boards of health are charged with the enforcement of registration laws. Nevertheless, while nearly every state in the Union is provided with a state board of health, less than a dozen states possess and enforce in a fairly effective way laws for the registration of deaths.

States having approximately complete returns of deaths are designated "registration states" by the Census Bureau. The standard is not a high one, only about 90 per cent. of accuracy being required for admission to the class. Even thus, there were only nine states entitled to inclusion for the last census year, 1899-1900. These states were the six New England states, New York, New Jersey and Michigan. The District of Columbia, which is identical with the city of Washington, is not included as a state area in the above statement. Indiana's excellent system for the immediate registration of deaths was not in effect for the entire census year 1899-1900, although available for the calendar year 1900.

The returns from the registration states, together with the deaths collected in the registration cities of over 8,000 population in non-registration states, constitute the records for the total registration area of the United States.

All of the registration states, with the exception of Michigan and Indiana, belonged, in 1900, to the North Atlantic division, and this geographic section of the country was completely a registration area except for the state of Pennsylvania. The only other division containing any registration states was the North Central, to which Michigan and Indiana belong.

The non-registration states, which include, territorially, by far the larger portion of the country, were represented only by their registration cities of 8,000 inhabitants or more. These cities increased in number from 83 in 1890 to 153 in 1900, but even then immense portions of the country were entirely without adequate representation in mortality statistics. Many of them were clustered in Pennsylvania and Ohio, Illinois, Wisconsin, Iowa and Minnesota. There are only about a score to represent the entire south, and as many for the entire country west of the Mississippi river. It should be understood that not all cities of 8,000 population or over are considered as registration cities, but only such as have effective registration in force.

The extension of the registration area, and more particularly the increase of the number of registration states, is one of the most important objects with which the Census Bureau is concerned in its relations to vital statistics. Since 1850, the subject of vital statistics has been one of the chief branches of the census investigation, but not until the organization of the service on a permanent basis was it possible to systematically undertake the improvement of registration methods in this country. We stand, therefore, at the beginning of a new era in registration work, and a thorough study of the conditions of accurate registration and the practical difficulties in the way of its achievement should result in extensive additions to the registration area before the date of another decennial enumeration.

There has been much waste of effort in this direction in the past. Many states have passed laws intended to secure the complete registration of deaths, but have speedily found that they failed to do so. Such laws either became practically dead letters or remained in futile operation—the latter, perhaps, the more disastrous condition, as it deceived some into the belief that adequate registration laws were in force. Under the conditions of government in this country, the accuracy of registration depends entirely on the enlightened character of state laws or municipal ordinances in cities in non-registration states; the government has never undertaken to collect births and deaths directly, by continuous registration, in the states. Congress has strongly urged the passage of such laws by the state legislatures, and the Census Bureau is prepared to aid by advice as to the necessary details of a successful registration law and by utilization of the data returned under it for national purposes as soon as results are available.

IMPROVEMENT OF REGISTRATION METHODS SINCE 1900.

In addition to the list of states having effective registration in 1900, at least for the calendar year, there are certain others that require special mention as showing the active tendency toward the adoption of improved methods of registration in this country. In Colorado, beginning with January 1, 1902, the State Board of Health issued rigid regulations, under the authority of the state law, providing that undertakers or those acting as such should file certificates of death and obtain burial or removal permits from the local registrars. Certificates are of the standard form recommended by

* Read in the Section on Hygiene and Sanitary Science of the American Medical Association, at the Fifty-fifth Annual Session, June, 1904.

the United States Census Bureau and American Public Health Association, and are made out in duplicate, one to be filed with the local registrar as his permanent record, the other being returned at once directly from the undertaker to the secretary of the State Board of Health. Permission of the local registrar for the burial or removal of the body is entered on each certificate. By means of this system of immediate returns, Colorado secures more timely information of the occurrence of deaths, and the distribution of mortality from important causes, than is ordinarily obtained in registration states, while the general results of registration, as given from month to month in the bulletin issued by the board, would seem to indicate that a large proportion of all deaths is secured. The Colorado system deserves careful study and may serve to point out the way to secure accurate results in states having very sparsely settled populations.

Illinois has had a long and interesting history with respect to registration legislation, and as evidence of the pressing demand for satisfactory provisions for the collection of such data, and the necessity for very careful adjustment of methods so that the minimum amount of trouble will result to the undertakers and the people, the passage of the act of 1901 and its displacement by the act of 1903 may be cited. The act of 1901 was intended to obtain fully complete and accurate statistics of births and deaths for the entire state, the thoroughness of the registration of deaths being insured by the rigid requirement of burial and removal permits before any disposition could be made of the bodies of deceased persons. This provision, without which no state has heretofore succeeded in obtaining accurate mortality statistics, was undoubtedly entirely feasible for Illinois, as it is regularly employed in Michigan and Indiana, adjacent states presenting very similar conditions, as well as in all of the other registration states. Unfortunately, however, the law did not provide for a sufficient number of local registrars in some of the sparsely settled portions of the state, and it was found difficult or impossible to comply with the requirement of permits. This difficulty caused the repeal of the law, as a substitute for which the present system was adopted, by which physicians send certificates directly to the State Board of Health. Burial or removal permits are not required except in cities having local ordinances to that effect. Whatever may be the effectiveness of this plan, which is now under trial, it will doubtless be prudent to defer any further attempts at improved legislation until the capabilities of the present system have been thoroughly demonstrated.

Maryland was not accepted as a registration state at the date of the last census. Since that time, much work has been done by the Maryland State Board of Health in improving the character of the returns, and I am very glad to state that in the judgment of the secretary, Dr. John S. Fulton, whose valuable services as member and chairman of the committee on demography of the American Public Health Association have contributed greatly to the advancement of registration work in this country, Maryland has fully reached the standard of completeness required for admission to the list of registration states. If this be so, it is a sign of peculiar interest and hopefulness, because it means the accession of the first state of the South, with a considerable proportion of colored population, to the registration area.

IOWA'S NEW REGISTRATION LAW.

It is not possible, of course, to precisely determine the results of the operation of a law before it goes into effect, much depending on the efficiency of its administration as well as on the amount of moral support lent to its enforcement by the people among whom it is to operate. The people of the state of Iowa, however, have for a long time displayed a deep interest in the establishment of adequate methods of registration of vital statistics in that state, and from the first organization of the State Board of Health in 1880, the collection of vital statistics has been an important part of its duties. The original Iowa law required reports of births and deaths to be made by physicians to the county clerks, who in turn reported to the State Board of Health. This system was a failure, and the substitute, passed in 1897, whereby assessors were required to collect information in regard to births and deaths when making the annual assessment of property, was equally worthless. Wherever this plan has been tried, as in laws in force today in Ohio, Pennsylvania, Michigan (for births), and other states, no good results ever have or ever can be obtained. It is therefore very fortunate that the Iowa legislature of 1904, a joint session of whose committees on public health I attended on February 17, as a representative of the Census Bureau at the request of the State Board of Health, entirely discarded the methods that have been proved of no value by past experience, and adopted a law calling for all the essential requirements of accurate registration as formulated by the leading sanitary and registration authorities of this country.

Under the new Iowa law, taking effect July 4, 1904, certificates of death of the standard form recommended by the United States Census Bureau and the American Public Health Association, and indorsed by the American Medical Association, are required for all deaths in the state; burial or removal permits being issued thereon by local registrars. These officials, whose work is of the first importance for the practical conduct of a registration system, are provided for every township and city in the state, burial or removal permits being issued thereon pointed in sufficient number so that no difficulty or hardship should result to undertakers or to the people in any part of the state on account of the thorough enforcement of the law. This is an important matter. It should be made as easy as possible to file the certificates and to obtain the permits without delay or without being compelled to go any great distance. The people of this country will not submit to unnecessary "red tape" nor undergo hardships in complying with the provisions of a law whose great usefulness, at first, they may not fully comprehend. Every unnecessary source of friction should be carefully avoided in framing the provisions of such a law, while at the same time the fundamental requirements must be included or else the law will not be a success.

The certificates, when filed with the local registrars, are recorded at once, and on the fifth day of the following month are returned directly to the secretary of the State Board of Health at Des Moines, who is thus enabled to keep in constant touch with the variations in mortality from different diseases throughout the state. The central office has direct control over local registrars, whose compensation of twenty-five cents for each certificate properly filled out and promptly returned depends on the faithfulness of their work. Payment for certificates originally registered with subregistrars is divided, while registrars receive compensation for making monthly returns of "No births" and "No deaths," which enable the central office to know that each district in the state

is included in the monthly returns. With these provisions effectively administered throughout the state, there should be no doubt as to the approximate completeness of results from the first day of the operation of the law, and Iowa will at last posssess, after nearly a quarter of a century of futile efforts, statistics of mortality that will be entitled to full faith and credit as authentic data, without discount for imperfections in returns.

THE MOVEMENT IN PENNSYLVANIA.

It is very gratifying that an active, aggressive campaign has been begun, through the Associated Health Authorities of Pennsylvania, to bring about the adoption of an efficient system of registration and to add that state to the registration column. At the recent meeting at Gettysburg, held on May 26-27, 1904, the following resolutions were unanimously adopted:

WHEREAS, The accurate registration of vital statistics is an indispensable requisite of an efficient modern public health service; and

WHEREAS, The congress of the United States, by joint resolution, has called on the authorities of the various states to co-operate in establishing such registration; therefore be it

Resolved, That we, the Associated Health Authorities and Sanitarians of Pennsylvania, assembled in annual meeting at Gettysburg, May 26-27, 1904, do hereby most earnestly recommend to the next legislature of Pennsylvania that a law be enacted which shall provide for the thorough and complete registration of vital statistics throughout the entire state, and especially that all deaths, with the causes of deaths, be recorded by means of standard certificates, as recommended by the U. S. Census Bureau and the American Public Health Association, and that burial or removal permits be issued prior to any disposition of the body.

Resolved, That a special committee of three members of this association be appointed to co-operate with the State Board of Health and Vital Statistics of Pennsylvania, committees from the Pennsylvania State Medical Society, of the American Medical Association, and with the U. S. Census Bureau, in drafting and supporting a satisfactory bill for this purpose; and

Resolved, That the achievement of the registration of all deaths, with their causes, immediately after their occurrence, and the prompt return of certificates of death from local registrars directly to the central bureau of vital statistics, which shall constitute a part of the organization of the State Board of Health, thereby giving the sanitary authorities of the state timely information of the exact prevalence and distribution of disease, is the most important of all sanitary measures and should be unremittingly urged until successfully carried out in this state.

The committee was immediately appointed, consisting of Dr. Wilmer R. Batt, chairman; Dr. Benjamin Lee and Hon. Milton A. Embick. Dr. Batt, who, as state quarantine officer at large in sole charge of the operations of the Pennsylvania State Board of Health for the suppression of the recent terrible epidemic of typhoid fever at Butler, has gained a national reputation for his prompt and effective work, will use the same unremitting energy to obtain what the sanitarians of Pennsylvania have unequivocally recognized as the most important of all sanitary measures, namely, the providing of a firm and lasting foundation for all the future sanitary work of the state by means of the collection of trustworthy vital statistics.

PROSPECTS IN OTHER STATES.

When we consider the large blank areas on the map of the United States that are totally unrepresented by accurate mortality statistics, the outlook seems a little discouraging as to the early approach of the time when the United States shall have, like other civilized countries, a system of registration of vital data in which the entire nation is represented. Probably sufficient efforts have been wasted in the past to nearly or quite achieve this result, were it possible to employ all the misapplied energy, and the fact that there are now movements in many states, besides those in Colorado, Illinois, Maryland and Iowa already referred to, gives fair prospect for hoping that the census of 1910 will include a larger list of newly-added registration states than has ever been obtained during an intercensal period.

In Ohio a bill was introduced at the recent session of the legislature and supported by the sanitary authorities of the state. For various reasons it did not succeed in passing, but the necessity of such legislation as a *sine qua non* of efficient public health work was fully recognized, and it is only a matter of a short time when Ohio, with Pennsylvania, must inevitably adopt modern methods and bridge over the gap now existing between the registration states of the East and West.

California will make an effort to secure an improved and fully efficient law next year. The State Board of Health is considering legislation for this purpose, and its efforts will undoubtedly be strongly supported by the medical profession and by the enlightened public of the state. The interest of the California State Medical Society in the movement may be shown by the following extract from the presidential address of Dr. H. Bert Ellis at the annual meeting of this year:

It should be almost unnecessary to recount to a society of physicians the numerous reasons why an accurate registration of vital statistics is absolutely essential to the proper sanitary administration of a state. Vital statistics, and especially correct mortality statistics, are fundamental to a progressive public health administration. It is as unsatisfactory to attempt to conduct a public health service, either of a city, a state or a nation, without reliable statistics of mortality, based on the immediate registration of all deaths as they occur, as it would be to manage a large business enterprise without some adequate system of bookkeeping. To know the influence of modern methods of sanitation and prevention of disease on the public health, the statistics of deaths must be accurately known. The progressive health officer must be on the alert to watch the movement of mortality from important diseases, and he can only judge of his success at restricting these diseases by studying variations in mortality and in sickness.

Nearly every state in the country has attempted to secure a satisfactory system of recording vital statistics, yet up to the present time less than a dozen have adequate laws for the registration of deaths alone, and I believe that there is not a single state, and probably not even a single city in the United States, that has to-day a complete registration of births. This should receive the attention and the active support of every physician in the state, and especially the consideration of our members and of our county societies. I therefore recommend to this society that a committee of three be appointed on vital statistics, to co-operate with the public health committee of the American Medical Association.

At a recent meeting of the Louisiana State Medical Society, held in New Orleans May 9-10, 1904, the committee on vital statistics, through its chairman, Dr. E. J. Granor, made a report which was adopted by the society in favor of co-operation with the state and national authorities for the improvement of vital statistics in that state. A bill was introduced in the last session of the Florida legislature by Dr. Porter, state health officer, which was closely in accord with the forms of law recommended for adoption by the Census Bureau; unfortunately it did not pass, but renewed

efforts will be made to bring registration in Florida up to the proper standard. A bill was also introduced by the State Board of Health at the last session of the Mississippi legislature, but, for various reasons, it did not become a law. Texas has recently changed the title of its quarantine department to the "Department of Public Health and Vital Statistics," a law having been enacted requiring the return of births and deaths through the county clerks to the State Board of Health—a plan similar to that of the old Iowa law, which was not a success in practice. The work of the recently created Georgia State Board of Health will depend on the accurate registration of vital statistics. This was fully recognized by the promoters of the law, as seen in the resolutions passed by the Medical Association of Georgia:

Resolved, That in the interest of the public health and a better study of the prevention of disease, the Medical Association of Georgia, through its legislative committee, urges the Georgia legislature to enact laws for the registration of vital statistics, as outlined in the joint resolution approved by the Senate and House of Representatives of the United States, Feb. 11, 1903.

Resolved further, That the Medical Association of Georgia co-operate with the American Public Health Association and the United States Census Office in efforts to extend the benefits of registration of vital statistics.

In many other states the problem of securing effective registration of vital statistics is receiving much attention from sanitary authorities. There are two classes of states which would seem to present unusual difficulties in the way of execution of proper laws, namely: 1, States having very sparsely settled populations; 2, states having a considerable proportion of colored population. Other things being equal, the facility of registration and the ease of enforcement of registration laws depend somewhat on the density of population. Associated factors are readiness of communication by rail and other roads, wealth, intelligence and absence of a large illiterate element. From a diagram showing the states ranged in order of density of population, with some distinction of their various constituent elements, we can gain an idea of the probable limitations of the extension of accurate registration methods, as well as form some judgment as to the states where such efforts ought to meet with early success. Pennsylvania and Ohio, nearly at the head of the list in thickness of settlement, ought at once, from every conceivable point of view, to qualify themselves as registration states. If Michigan and Maine, low on the scale of density, can execute effectively laws for the immediate registration of deaths, including the requirement of burial permits, then all of the states above except such as have many negroes included, ought to be able to do the same. Colorado, if the registration of that state is in fact effective, carries the limit of possibility still further. And then the states of the South, where a large colored population, largely illiterate, has rendered accurate registration difficult or impossible—will it be necessary to devise new measures for securing their vital statistics or will the general methods heretofore recommended be found practicable? The conditions in each state require most careful consideration, with the help of the local authorities, and while earnest efforts should be made to secure effective results wherever reasonably possible to do so, it should be remembered that methods adapted to densely populated, wealthy and educated communities can not always be applied, without radical changes, to sparsely settled, poor and ignorant ones.

So far I have chiefly given attention to the questions affecting the extension of the registration area, this being a matter of fundamental importance, and also the particular line of effort to which the American Medical Association is lending its aid. At the last session of the Association at New Orleans a paper was presented to this section by Mr. W. A. King, Chief Statistician of the United States Census Bureau, on "Co-operative Work in Registration Methods and Vital Statistics," which fully stated the various ways in which the Census Bureau is endeavoring to improve the registration of vital statistics in this country, and resolutions were adopted by this section and transmitted to the House of Delegates calling for the appointment of a special committee to co-operate with the committees of the American Public Health Association, Conference of State and Provincial Boards of Health of North America, and with the United State Census Bureau and other government authorities interested in this work. The special committee was not appointed as the section desired, but the resolutions themselves were indorsed and the matter referred for action to the already existing Committee on Public Health. A circular was printed by the committee entitled "Co-operative Agencies for the Extension of the Registration Area and Improvement of Vital Statistics in the United States," which was addressed to the officers and members of state and county medical societies asking their interest and active co-operation in the adoption of better laws for the registration of births and deaths. The recent reorganization of the medical profession should be of special value in promoting the effective expression of medical opinion on this subject.

In the division of labor among the various national organizations, the question of uniform and comparable tables for the presentation of vital statistics in official reports and bulletins, and also the adoption of uniform methods in estimating populations and computation of rates, fell to the Conference of State and Provincial Boards of Health of North America.

The very important subject of the relation of morbidity to mortality statistics has been undertaken by the official Conference of State and Territorial Boards of Health, whose second annual meeting was held at Washington, June 3, 1904, on the call of Surgeon-General Wyman of the United States Public Health and Marine-Hospital Service.

An important practical condition for obtaining uniform statistics of deaths is the use of a standard form of certificate containing all the information desired by the government. Over a dozen states have already adopted this blank, prepared by the United States Census Bureau in co-operation with the American Public Health Association, and many cities in non-registration states use the same form. The employment of the international classification of causes of deaths, together with the preliminary work for its revision and the adoption of a uniform method of rating several causes of death when jointly returned for the same death, is also being conducted by the Census Bureau in special connection with this association.

Taken altogether, it is the purpose of the Census Bureau to keep in touch with all classes of effort to improve the registration service of this country and to make vital statistics a more influential factor in the practical work of sanitary administration, recognizing

the accurate registration of births and deaths as the absolutely indispensable basis of satisfactory public-health work. The full appreciation of this fact, the education of the people to the value of vital statistics and the necessity, if they be collected at all, that they be collected with such completeness and precision that they may be fully depended on, rests with the medical profession. All the systems of registration in this country owe their existence to the efforts of medical men, and now that it is possible to systematize and direct such efforts, through the thoroughly organized profession as embraced in the American Medical Association, the number of registration states and cities ought to be rapidly increased and the usefulness and ready comparability of vital data be greatly enhanced in the immediate future.

DISCUSSION.

DR. SENECA EGBERT, Philadelphia, stated that he has tried to impress on his students the importance of the proper registration of all vital statistics and their duty as physicians to return such data to whatever authority may be specified by the law. In 1903 he delivered an address on this subject before the Pennsylvania State Medical Society. He was led to select this subject by going over the volumes on vital statistics which comprise part of the United States Census Reports for 1900. One of the facts which appealed forcibly to him at that time was that Pennsylvania's registration returns were incomplete and unsatisfactory. Wherever the registration of vital statistics is improved the general sanitary conditions are also improved. Every physician should realize that there is only a comparatively small area of the country which is able to supply satisfactory vital data for use, and that it is important that the remainder of the states should adopt adequate and uniform registration systems at the earliest possible date.

DR. C. C. BROWNING, Highland, Cal., asked Dr. Wilbur if he has given consideration to the topography of the country with reference to the probable cost and ability to secure vital statistics. For instance, Colorado is well down in the list in population per square mile. From there is a long break, which includes a large number of states of the middle west. Now there is an essential difference in population per square mile in Colorado and those other states. The other states are comparatively level states, with an agricultural country, where the population naturally is isolated, but fairly evenly distributed over the entire territory. In Colorado, and from there west, there is a comparatively small portion of each state that is habitable; the inhabitants are grouped together in fertile valleys to a certain extent, under irrigation systems. Of course there are mining industries, and in certain parts of California and Oregon there are large wheat-growing districts, but there one will find a country more analogous to Rhode Island, and Dr. Browning asked if that would have any bearing on the final result.

DR. CRESSY L. WILBUR said that registration would be certainly very much easier in the states that Dr. Browning last referred to, and he very recently made a comparison of the distribution in the states of California and Colorado on that basis, showing the number of towns and the density of population in the different areas. Of course it is easier to get registration of deaths where the people are aggregated in somewhat densely settled communities. Dr. Wilbur said possibly it might be of use to have the resolution passed by the sanitary authorities of Pennsylvania indorsed by the section. The resolution is as follows:

RESOLVED, That the registration of vital statistics is of paramount importance in sanitary administration, and that the Section on Hygiene and Sanitary Science earnestly commends the resolution of the Associated Sanitary Authorities of Pennsylvania in proposing the achievement of such statistics for Pennsylvania as the most pressing object for immediate effort by sanitary workers in that state.

On motion the resolution was approved. This resolution was later referred to the House of Delegates and was approved by that body.

SOME TYPHOID EPIDEMICS STUDIED BY LABORATORY METHODS.*

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BALTIMORE.

[From the Bacteriologic Laboratory of the State and the City Boards of Health.]

The object of the present paper is to briefly describe several epidemics of typhoid fever, in which the bacteriologic examinations enabled the State Board of Health to locate the sources of the infection, and in most of the cases to prevent further trouble.

The first outbreak of typhoid fever to be described occurred in a city numbering about 12,000 persons, in which one side of the city was in one state, and the other side was in a neighboring state. This circumstance gave each portion of the town a separate water supply, and in the portion which we shall call the south end, inhabited by about 6,000 persons, an outbreak of typhoid fever broke out, which affected several hundred persons.

The north side of the town, as mentioned above, was not supplied by the same water supply, and practically no fever occurred in this portion of the town. The towns were divided by a certain street, and it was said that the line of demarcation between the infected and non-infected portion of the city was a striking feature of the outbreak.

I did not visit the place personally, but was informed that the water supplying the infected portion of the town was obtained from a spring in a hollow, while the uninfected portion was supplied with water from a spring some distance away in the hills. I did not get any statement concerning the sewerage, and can not account for the pollution of the supply, but the bacteriologic examination from the spring showed 9,600 bacteria per cubic centimeter, and the colon bacillus was present in 1/10, 1, and 50 cubic centimeters of water. Two examinations of the tap water of the infected town showed 6,500 and 1,000 bacteria per cubic centimeter, and the colon bacillus was again demonstrated as above.

The interesting feature of this epidemic was the confirmation of the well-grounded suspicion that the water was infected. This was proved by the bacteriologic demonstration of the colon bacillus in the water.

The second epidemic was somewhat similar to the first one, since, in this instance, two suburban towns immediately adjoining each other formed a marked contrast. R—— P——, a town of about 2,000 inhabitants, was furnished with water from a spring, which only contained 15 bacteria per cubic centimeter, and in which the colon bacillus was not detected even in 50 cubic centimeters. About one month after this examination was made, an outbreak of typhoid fever occurred in the adjoining town. This town numbered about 750 inhabitants, and there were 33 cases of typhoid fever. The water supply of the first town was again examined, and only 35 bacteria per cc. were found, and no colon bacilli were detected in 50 ccs. of water. Not a single case occurred in this place, but in E—— P—— the contrast was marked.

On investigating the water supply, it was found that the water was supplied from artesian wells, and the bacteriologic findings were at first quite difficult to reconcile with this fact. Seven specimens were examined, from various houses in the town, and *Bacillus coli com-*

* Read in the Section on Hygiene and Sanitary Science of the American Medical Association, at the Fifty-fifth Annual Session, June, 1904.

munis was found in three instances. Two of the houses not showing the colon bacillus, however, were supplied by the pure water of R—— P——. The bacteria were never over 50 per c.c., thus retaining the count characteristic of deep ground water. The water from the pumping station and the water tower was next examined, and the colon bacillus was found in one cubic centimeter in both samples of water. The bacteria had now increased to 600 per cubic centimeter.

The sanitary survey explained the source of the contamination, and the following description of this investigation is therefore of some interest:

In addition to the artesian wells referred to above, there was a spring located in a ravine between the two villages. This spring was used occasionally to flush out the artesian wells when they became clogged with sand and gravel.

The water in the tower was not used constantly throughout the service, but was drawn on when an excessive demand was made on the wells. This accounts for the fact that the colon bacillus was not always found when examinations were made of the water from the various houses.

A later examination than that noted above showed colon bacilli in the spring, in the water tower, and in six houses, but demonstrated its absence in water drawn directly from the artesian wells when the spring was disconnected from the wells.

As a result of these findings, the spring was entirely disconnected from the service, and all water was drawn from the water tower. The water tower and pumps were filled with a 1 to 1,000 solution of formalin, which was allowed to stand for 48 hours, then drawn off, and the same flushed for 24 hours with water from the pure wells. After a week, the bacteriologic examination showed the absence of colon bacilli from the tower, wells, and service, and 10 bacteria per cc.

Since that time, monthly examinations have demonstrated a continuation of this condition of the water, and no cases of typhoid have since occurred in any household supplied by this service.

A contributory confirmation of the fact that the water caused the typhoid fever was observed in a slight outbreak that occurred in a convent about one mile from this town. On investigation, it was found that this convent obtained water by a pipe-line from the infected spring mentioned above. The colon bacillus was found in the water, and the bacteria per cubic centimeter numbered 3,000. The colon bacillus disappeared from this supply after the remedies were applied which have been mentioned above.

Just after this outbreak subsided in E—— P——, three cases were reported in the same house at R—— P——. An examination of the water again showed very few bacteria, and no colon bacilli. It was found that the milk was served to this house by a milkman whose son was the last person to develop typhoid fever in the epidemic just described. The well which was used for washing the cans, and, perhaps, for watering the milk, was examined, and the colon bacillus was demonstrated in 1 cc.

It is very probable that this localized outbreak was caused by infected milk, since the patients were young people who did not leave the park for any considerable time, and the water they drank was proved to be pure by several examinations.

As is well known, milk furnishes an ideal culture medium for the typhoid bacillus, and even if a few are originally introduced into the milk, they will often enormously increase in numbers before they reach the consumer.

AN OUTBREAK OF TYPHOID TRACED TO THE MILK SUPPLY.

The next epidemic to be described could be clearly traced to the milk supply, and it is my opinion that infected milk is more frequently the cause of typhoid fever than is generally supposed.

Although there are a number of so-called milk epidemics of typhoid fever on record, yet the most conclusive study that was ever published was recorded by Fulton in the *Journal of Hygiene,* October, 1901.

These cases occurred in the town of Elkton, Md., which was supplied by water from a river in which the colon bacillus was not demonstrated in tests made at the time. This town had 2,542 inhabitants, and milk was supplied by four dairymen. A. had the largest number of customers, and during the fall Mrs. A. and her son both had typhoid fever, but they both continued to milk the cows and handle the milk during the early part of their attacks.

We were not allowed to examine the blood for the presence of the Widal reaction at the time, but after the patients had recovered, we received a specimen of the blood of Mrs. A., which still gave the reaction for typhoid fever. The presence of typhoid fever was thus proved, and a bacteriologic examination of the well on the dairy farm demonstrated the presence of the colon bacillus.

The milk might have been infected by the typhoid bacillus, either by watering the milk from the infected well, washing the utensils in the infected water, or by the direct infection of the milk with the typhoid bacillus by means of fingers soiled with typhoid intestinal material.

A few days after these persons took to bed, three cases of typhoid fever were recognized in the town, all of which cases were on the milk route of this dairyman. During the next month, 61 cases developed, and in every case these persons were supplied with A.'s milk. Three cases occurred at this time, which were either imported or which could be traced to other causes.

This epidemic is a striking study, since these 61 cases all took milk from the one source, and a series of cases studied by the sub-department of health recently in Baltimore also showed that these cases were traceable to an infected milk supply.

It was noticed that a large number of cases of typhoid fever were occurring in a factory in the city which employed 1,500 young girls and women, and 400 males. Several physicians called the attention of the department to the cases that they were getting from this factory, but we had no method of finding out the exact number of cases which developed from the factory. On investigation, the number of absentees was reported as 200, but the manager thought that many of these employes were absent from other causes than sickness. Several deaths occurred, but here, again, we could not obtain exact numbers.

The water supply was obtained from the city mains, but is run through a coil of pipes in ice. All the employes used this for drinking purposes, but it was noted that practically all the cases of typhoid fever were females.

This made us think of some special article of diet which was only used by the girls and young women, and on inquiry we learned that a light lunch, consisting of a sandwich and milk, was furnished to the employes.

Practically all the women took their lunch in the factory, but the men preferred the beer of a neighboring restaurant, and did not take lunch in the factory.

This milk was furnished in 20-gallon lots by a dairyman just outside the city limits. In company with an inspector, I visited the farm, and found it in the following condition:

The house was in a valley about 50 feet from the road, but we could not get any history of typhoid fever there or in the neighborhood. The well was 25 feet from the house, and 100 feet deep. It was not protected from surface drainage, and the privy was about 50 feet from the well, the ground being level. There was a boggy stream of water flowing from the well towards the privy, which contained a box full of fluid fecal material, and the place for cooling the milk was next to this place. Many flies were about the box, and could easily enter the cooling room from this place. Chickens were found in the cooling room, jumping over bottles. The cooling box for cans contained a slimy, rusty lot of water.

The bacteriologic examinations made from the factory showed that the water did not contain any colon bacilli, and only 450 bacteria per cubic centimeter, and the ice was also free from intestinal pollution, but contained 1,800 bacteria per cubic centimeter.

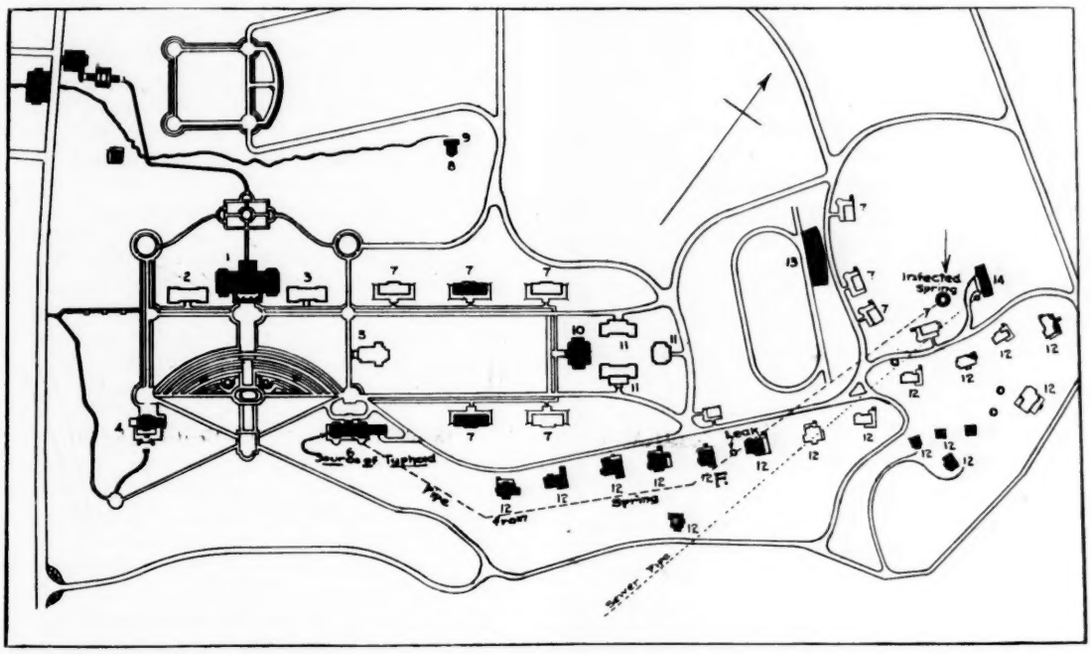
The milk contained 4,500,000 bacteria per cubic centimeter, and the colon bacillus was found in 1/1000 of a cubic centimeter. This showed concentrated fecal pollution of the milk supply, and the water from the well on the dairy farm also contained the colon bacillus and 6,000 bacteria per cubic centimeter. The ice contained the colon bacillus in 1 cubic centimeter, and ran 5,000 bacteria per cubic centimeter.

It will be seen that all of these findings confirmed the suspicion that the milk was the cause of the epidemic, and explained the exclusive incidence of the outbreak among the females, since these were the only employes of the factory that drank the infected material. The milk was discontinued, and we had no further complaint from the factory.

In the suburban community of S——, numbering 400 persons, we were able to prove a rather long period of incubation by a study of the outbreak.

The pump from the deep well which supplied good drinking water became disabled on the night of July 3. Several examinations of this water showed about 250 bacteria per cubic centimeter and the colon bacillus was not found in 1 or 50 cubic centimeters.

The supply for July 4 was drawn from a well which contained 3,000 bacteria per cubic centimeter and the colon bacillus. On July 5, the regular supply was restored. The use of infected water was therefore confined to July 4. On July 9, 10 and 11, some 25 persons were seized with gastrointestinal symptoms. All had diarrhea, and nearly all had fever. One had fever, bloody stools and loss of weight; two had delirium, chills, fever, and diarrhea. All recovered in from three to seven days. None of these were regarded as cases of typhoid fever. On July 27, two young ladies, and on August 1, a third, fell ill of typhoid fever. Other sources of infection than the water supply of July 4 were carefully excluded. Here, after one day's exposure, we have incubation periods of 23 and 28 days. The attack rate was .75 per cent. among 400 people of all ages.



Plot of the grounds and buildings: 1. Memorial Hall. 2. Library. 3. Science. 4. Directors' residence. 5. Chapel. 6. Institute Inn. 7. Dormitory. 8. Power house. 9. Laundry. 10. Gymnasium. 11. Dining hall. 12. Instructors' residences. 13. Grandstand. 14. Infirmary. The buildings in solid black are completed, those in outline are proposed.

The last outbreak of typhoid fever which I shall describe occurred at ——, a large college situated on a high bluff overlooking a river. The community numbered about 300 persons, including professors, students, day scholars, and attendants.

The diagram shows the situation of the principal buildings, and a general description of the plan of the institution is unnecessary. It is important to mention the situation of several buildings, however, in order to describe the interesting points concerning the conveyance of the typhoid infection.

It will be noticed that No. 14 indicates the infirmary, and that the line marked "S" indicates the course of the sewage pipe from the infirmary down a slope, to empty later into the river. At the point marked "Spring," the

sewage pipe passed within 20 feet of this spring, and the circumstances to follow are so suspicious that it seems probable that the spring was infected by seepage from the sewer pipe through the ground to the spring. It was reported at the place that the pipes were dug up, and no gross leakage discovered, but this does not entirely preclude the existence of a break or slight seepage farther away from the spring.

W. P., aged 16 years, visited Pittsburg, Pa., for the Christmas holidays, 1903. Returning to school, he was attacked the middle of January and sent to the infirmary, where he went through an ordinary attack of typhoid fever, and was discharged March 5. The subsequent cases occurred as follows: March 3, 1 case; March 5, 1 case; March 7, 2 cases; March 8, 1 case; March 10, 3 cases; March 13, 1 case; March 14, 2 cases; March 15, 3 cases; March 16, 1 case; March 18, 1 case; March 19, 2 cases; March 21, 2 cases. This whole group all took their meals at the institute inn, except one teacher and his child of 2 years, and a young woman visitor of 26 years. No servants were attacked in any part of the institution.

The sewer pipe from the infirmary ran down the terrace and passed within 20 feet of the spring, and continued thence down to the bottom of a ravine, about one-quarter of a mile.

Among the day pupils there was but one case reported, a girl of 14 years, who had good opportunities to get an infection at home, in an adjoining village.

It will also be noted in the diagram that 12 F indicates the residence of Prof. F., and he was the only professor who developed the fever. Two cases occurred in his house, and on inquiry we found that he had been drinking the water which had appeared above ground as a leak in the pipe from the spring which has just been mentioned, and which was situated down the hill about 100 yards from the infirmary. This spring also furnished the inn, marked No. 6, with water. It will thus be seen that the only persons who developed typhoid fever drank water from this special spring; and it may be mentioned in passing that those who escaped the fever obtained their drinking water from other springs or sources which it is not necessary to mention in this report.

In order to eliminate other causes, so far as possible, the ice which had been occasionally used by a druggist for ice-cream sodas sold to students, was examined, and it was found to contain 1,350 bacteria per cubic centimeter, but no colon bacilli were found. The milk from the inn from which all the cases of typhoid fever had developed was also examined, and only 45,000 bacteria per cubic centimeter and no colon bacilli were demonstrated. Samples from four springs, which supplied the students who did not develop typhoid fever, did not show any colon bacilli in 1 or 50 cubic centimeters, and the bacteria varied from 3 to 150 per cubic centimeter. The spring at the foot of the hill from the infirmary, and which supplied the inn with water, contained 300 bacteria per cubic centimeter, and Dr. W. W. Ford found that it contained the colon bacillus.

I isolated an organism from this spring, which was first thought to be the typhoid bacillus, as it was very motile, did not produce indol or gas, did not liquefy gelatin, decolorized by Gram's method, grew invisibly on potato, and was similar to the typhoid bacillus in its microscopic appearance and the appearance of its colonies. It slowly rendered milk alkaline, however, and was not pathogenic for guinea-pigs by intraperitoneal injection. It only agglutinated at a dilution of 1 to 10 in an immune serum of the agglutinative strength of 10,000, and did not agglutinate at 1 to 50 with typhoid fever specimens which readily agglutinated known typhoid organisms at this dilution. Although similar to the typhoid bacillus, it was not regarded finally as a true typhoid bacillus.

It is impossible to state positively that the first case of typhoid fever, which had been contracted in Pittsburg, was the cause of the outbreak, but it seems probable that the sewage from the infirmary that housed this case infected the spring. It is certain that the cases of typhoid fever which occurred after this were caused by this infected spring, since no cases occurred in persons who did not use this water. The outbreak ceased as soon as the use of the spring was discontinued.

It might be stated in conclusion that a careful sanitary survey in cases of typhoid outbreaks is of great importance, but that bacteriologic examinations of water and of other fluid foods will frequently confirm well-grounded suspicions by positive evidence. I am indebted to Dr. J. S. Fulton for much information found in this report.

DISCUSSION.

DR. HENRY B. BAKER, Lansing, Mich., asked Dr. Stokes if he followed the investigation any further than finding the colon bacillus. In the state laboratory of hygiene at the University of Michigan white rats are injected with inoculated cultures.

DR. G. T. SWARTS, Providence, R. I., asked whether chemical analyses were made, and in how many instances examinations of the locality were made as to pollution. The three factors called for are bacteriologic, chemical examination and sanitary inspection.

DR. WILLIAM R. STOKES stated that the test in the laboratory was only for bacteria per c.c. and the presence of the colon bacillus in one and in 50 c.c. of water. The three examinations were nearly always made. The State Board of Health has a regular form to be filled out by the inspector. The sanitary surveys are usually confirmed by the laboratory analysis. Dr. Stokes was unable to say how often the chemical examination agrees with the bacteriologic and in this particular epidemic he does not remember any chemical analysis, but they usually make three, the chemical, bacteriologic and sanitary surveys.

SOME UNCOMMON FORMS OF MULTIPLE NEURITIS,

INCLUDING FOUR CASES OF PUERPERAL ORIGIN.*

WHARTON SINKLER, M.D.

PHILADELPHIA.

It is only within a comparatively few years that multiple neuritis has been recognized as a disease. Twenty-five or thirty years ago it was an open question whether even diphtheria and lead palsy were due to a muscular affection or to disease of the nerves. As recently as 1879 Bristowe, in his Practice of Medicine, remarks, in connection with the pathology of lead poisoning: "But as regards the paralysis of the voluntary muscles, there is no doubt that Ducheane is right in regarding it as a consequence of nervous disorder. For if it were muscular not only should we find the muscular fibers degenerated in proportion to their loss of power, but we should find faradic contractility surviving as long as any healthy muscle was left. On the other hand, the rapid

* Read in the Section on Nervous and Mental Diseases of the American Medical Association, at the Fifty-fifth Annual Session, June, 1904.

shrinking of the muscles, without degeneration, and their speedy loss of faradic contractility, obviously point to lesion either of the nerve-trunk or of their nuclei of origin." As soon as it was pointed out that there was such a disease as an inflammation of the peripheral nerves, the knowledge of the subject rapidly advanced and the various forms of polyneuritis became well known.

By far the most common variety of multiple neuritis is that due to alcohol. This was described by Samuel Jackson, Sr., of Boston in 1822 as alcoholic paraplegia, but it has only been since the researches of Ross, Buzzard, Hun and others that the paralysis resulting from the excessive use of alcohol was known to be due to inflammation of the peripheral motor and sensory nerves. Alcoholic multiple neuritis is a comparatively common disease and may result from the excessive use of any beverages which contain alcohol. It was formerly thought that only spirits like brandy, whiskey and gin were capable of causing it, but it is now a recognized fact that even beer and light wines, if taken in sufficient amount, are capable of causing this affection. It is likely that persons leading a sedentary life are more liable to alcoholic neuritis than persons actively employed. This may account for the relatively greater frequency of alcoholic neuritis in women. Granted that the proportion of women who drink to excess is small as compared to the number of men who do so, there is a much greater number of cases of alcoholic neuritis among women than in the other sex. Starr says that of 250 cases of alcoholic neuritis which he has collected, there were 89 women. It is evident, therefore, that this is a large proportion compared with the ratio of drinking women to drinking men. It is most important, therefore, to bear in mind the fact of the comparatively frequent occurrence of alcoholic neuritis in women, especially in those who would not be suspected of the use of alcoholic stimulants. There is no doubt, however, that the habit of tippling in women exists to a considerable extent and one should always consider the possibility of alcoholism as a cause of neuritis in women.

One sometimes meets with cases in which there is only numbness of the extremities with a certain amount of impaired power, which must be considered as a mild form of multiple neuritis, and these cases are often observed in drinkers. They do not progress to the point of complete loss of power nor to very great sensory disturbance, but would undoubtedly reach a serious degree if unchecked.

The enormous consumption of various patent medicines, which are advertised as "nerve tonics," "health restorers," "blood purifiers," etc., is a much more frequent cause of alcoholism than is generally realized. Most of these preparations contain a larger percentage of alcohol than is found in wine or beer. In a recent number of the *Ladies' Home Journal*, the able editor, Mr. Edward Bok, points out in a straightforward way the dangers of using patent medicines, and shows that many of them contain alcohol, cocain, opium and other dangerous drugs, and quotes the Massachusetts State Board analyst in furnishing a list of patent medicines, with the percentage of alcohol each contains, ranging from 14 to 47 per cent.

Another cause of multiple neuritis which is becoming quite frequent in the large cities is the result of coal gas poisoning. In New York a large number of cases of coal gas poisoning are admitted to the hospitals every year, and a considerable proportion of these is followed by a severe type of sensory neuritis, which is very obstinate in responding to treatment.

Another and increasing cause of neuritis is poisoning by carbon disulphid. This is absorbed in the system by workers in rubber, from the inhalation of fumes from the heated rubber or from the dust containing particles of rubber which are inhaled. The earlier symptoms are general anemia and disturbance of the digestion. Following this, are paralytic and ataxic symptoms, with other evidences of neuritis.

Metallic poisons may produce multiple neuritis when taken internally or absorbed through the skin or lungs by workers in these substances. Among the most frequent of these is lead. As is well known, painters and manufacturers of white lead are frequently affected by this substance, but plumbism is also observed in other workmen. For example, those employed in china factories in which the glaze used contains lead are liable to lead neuritis.

An unusual source of poisoning is white lead in powder when used as a cosmetic. Some years ago I saw a young girl who had been in the habit of applying to her face a powder of lead carbonate, and she had, as a result, paralysis of the extensors in both the upper and lower extremities and was almost entirely helpless.

Copper, phosphorus and mercury may produce lead neuritis in those who work in these metals. Among hatters who handle nitrate of mercury in one of the felting processes, neuritis is not uncommon. Arsenical neuritis has been recognized for many years, but it is only occasionally seen as a result of the internal administration of arsenic for medical purposes. I have seen two or three cases of chorea which had been treated with Fowler's solution, in which multiple neuritis was produced. The following case is an example of this:

CASE 1.—Multiple neuritis following the administration of Fowler's solution.

Patient.—G. S., aged 7, was admitted to the Orthopedic Hospital and Infirmary for Nervous Diseases, January 19, 1900.

History.—The child has been healthy and normal, with the exception of knock-knees, for which he was treated successfully several years ago. A few weeks before admission he had an attack of rheumatism in the knees, associated with catarrhal jaundice. Following this, he had pronounced chorea, which was general. He was treated by the family physician with Fowler's solution of arsenic, given in increasing doses, and in a few days was taking twelve drops three times a day. About two weeks previous to admission, he began to have difficulty in walking, and finally became so weak in the lower extremities that he was unable to walk.

Examination.—On admission the child was found to be thin and there was marked discoloration of the skin in the groins and on inner side of the thighs. There was foot drop and he was unable to walk. The arms were weak, but he could feebly use the hands. Heart and lungs were normal; appetite was good. Electrical examination showed distinct reaction of degeneration in the anterior tibial and peroneal muscles, and very slight response to the faradic current in the anterior tibial and in the calf muscles. The knee jerks were absent, but there was no loss of sensation.

Treatment.—Massage and electricity were ordered and the boy gradually improved, but slowly. It was not until October, 1900, eight months after his admission, that he had entirely recovered. By this time he walked perfectly well and had full strength in his arms.

An epidemic of multiple neuritis occurred in England in 1899, as a result of drinking beer which was contaminated with arsenic. It was found on investigation that the source of the arsenic was the glucose which had

been used in the manufacture of the beer. Starr,[1] in an interesting article on the causation of multiple neuritis, referring to this epidemic in England, says: "Glucose, as is well known, is derived from corn and other kinds of starch by the action of sulphuric acid. Sulphuric acid is now manufactured from arsenical pyrites, and such acid is rarely free from arsenic."

Multiple neuritis is known to accompany or to be a sequel of diphtheria, grippe, typhoid and malarial fevers, and, in fact, any of the infectious diseases. Spiller has recently reported an interesting case of general neuritis following an attack of gonorrhea.

I have not seen reported any cases of multiple neuritis following puerperal septicemia,* and I will therefore record four cases which have come under my own observation:

CASE 2.—Multiple neuritis following uncomplicated labor.

Patient.—Mrs. O. G. H., aged 21, was admitted to the Orthopedic Hospital and Infirmary for Nervous Diseases, March 20, 1900.

History.—The family history is unimportant. The patient had smallpox many years ago, and in the summer of 1898 she had an attack of appendicitis, from which she recovered without operation. She has always enjoyed good health, but has been of a nervous temperament. She was married in November, 1898. Her child was born February 15, 1900. She had been perfectly well during the whole period of gestation. The labor was hard, lasting thirteen hours, but terminated without the use of instruments or anesthetics. There was no laceration. Patient did well, and there was no rise of temperature nor any evidences of septicemia. On the eighth day, she was able to sit up in bed and was feeling quite well. She had an abundance of milk and nursed her baby. At this time she noticed a difficulty about raising the left hand to the head and that there was a sensation of pins and needles in the fingers and tingling in both hands and face. Some hours afterward, she found that there was weakness in the right arm, and by evening it was found that the feet and legs were in the same condition as the upper extremities. On the ninth day, the patient sat up out of bed in a chair, but she could not move the hands, arms, legs or feet, and the extremities felt as though they were asleep.

Examination.—Her condition remained about the same until March 1, when she was seen by Dr. Ott. He noted at that time that the skin was hyperesthetic, that there was some loss of electro-faradic contractility and complete loss of power in the upper and lower extremities. There was also weakness of the voice. On admission to the hospital, she was found to be well nourished, her color was good, and there were no evidences of anemia. She was absolutely helpless and could not move either the upper or lower extremities. Sensation was normal as to touch and localization, and there was no thermal anesthesia. There was no decrease in the rate of transmission of pain sense, and the pain sense was acute. Dr. A. G. Thomson examined the eyes and reported: "The pupils are slightly dilated, but react to light and accommodation. Media is clear: disc in right fundus is normal; left temporal side of the disc is a little pale, but otherwise there is absolutely no change. There is complete paralysis of the right externus muscle and also complete paralysis of the left internus. Form fields are normal." The urine contained no albumin nor sugar; it was alkaline and contained a phosphatic deposit. There was no loss of vesical or of rectal control. An electrical examination by Dr. H. P. Boyer resulted as follows: "Reaction of degeneration in all of the muscles of the legs and arms; faradic response very poor in all of these muscles; in the tibialis anticus there is no faradic response."

Treatment.—The patient was treated by means of gentle massage and electricity, and was given strychnia internally. There was a gradual but steady improvement. On October 15, 1900, it was noted that she had improved in every respect; she was able to stand with a little support, but could not walk. She had full use of her arms and hands and was able both to feed herself and to do some sewing.

Result.—The patient was discharged November 21, able to walk and improved in every respect. Muscular wasting was still present to some extent. An electrical examination was made by Dr. Boyer, January 13, 1902, nearly two years after the onset of the neuritis. There was normal galvanic reaction in all of the muscles, with the exception of the tibialis anticus, in which there was reaction of degeneration. The faradic response was very slight in the tibialis anticus and in the calf muscles, but it could be elicited with a strong current. The faradic reaction in the forearm and other muscles was good. There was still some atrophy of the arms and legs.

CASE 3.—General neuritis following labor—septic.

Patient.—Mrs. M. S. R., aged 40, was seen in consultation with Dr. John M. Swan, to whom I am indebted for the following notes.

Family History.—Father living and well; mother died at the birth of the patient, of puerperal fever. No tuberculosis in the family, nor any other hereditary disease. Father is subject to violent headaches, and the patient has also been subject to severe headaches all her life.

History.—She had nearly all the diseases of childhood, but otherwise no serious illness. On February 10, 1899, after an apparently normal labor, she gave birth to a child. For two months previous to labor, patient complained of what she called "stitches" in her right side, feeling, she says, as if her "intestines were twisted." There had been pain in both legs for three weeks previous, and she was nervous and irritable. Soon after delivery, she had severe pain in the right inguinal region, which was so violent that it was impossible for her to sleep without being chloroformed, although morphia was used, but without relief. For some time, this pain was supposed to be neuralgic, and she was treated accordingly. The day after delivery, she was delirious and had a temperature of 103; the temperature continued high, ranging between 103 and 105 for three weeks. She was more or less delirious all of this time. At the end of three weeks, a mass was discovered in the right iliac region, which was painted with iodin and apparently dispersed. The temperature then fell to normal and remained so for several days, but it again rose, and for the next three weeks ranged between 101 and 103. The mass on the right side was again observed. On April 7, 1899, nearly three months after delivery, she was operated on for appendicitis, and a large amount of pus was found in the right iliac fossa. After the operation, she improved and her mind became more or less clear. It is a little difficult to determine exactly when the loss of power in the lower extremities appeared, as the patient's condition was such that she has no recollection of what occurred during the first three weeks, but the husband's impression is that the loss of power was discovered soon after labor. At all events, the patient complained much of pain and dull aching in both legs from time to time after her delivery, and when she began to improve in her general condition after the operation for appendicitis, it was found that there was total and complete loss of power in both legs.

Examination.—When seen in August, 1899, the following was her condition: A well nourished woman, 5 feet 4 inches in height, and weighing probably her normal weight, which is 148 pounds. The skin and mucous membrane were normal in appearance. The pupils were equal and responded to light; the tongue was moist and steady. The pulse was rather rapid, but the volume was fair and tension low. The heart and lungs were normal. The liver was noted by Dr. Swan to extend from the fifth rib to 1½ inches above the costal margin. The abdominal walls were extremely flabby, and the subcutaneous fat very thick. At McBurney's point there is a scar, 3½ inches long, which is still red, the result of the operation for appendicitis. Both thighs were atrophied, especially the lower part. The feet were extended and somewhat averted.

1. Med. News, January, 1902.

* Since writing the above I have read an interesting article on "Neuritis as a Complication of Some Portion to the Child-bearing Process," by W. R. Nicholson, M.D., American Medicine, May 28, 1904.

The joints seemed to be free, and sensation in both legs was good. The calf muscles were somewhat contracted, prohibiting free flexion of the feet. Knee jerk was absent on both sides. Temperature and tactile sense were preserved. There was no tenderness over the nerve trunks and no edema of the ankles. There was total loss of power in both legs below the knee, but the patient could flex the thighs.

Electrical examination: No muscles below the knee, with the exception of the right gastrocnemius group, respond to the strongest faradic current. Galvanic current, 21 cells. In the left leg, the posterior muscles show reaction of degeneration. Otherwise the reaction is normal. There was no loss of power in the upper extremities when the patient was seen, and it is her impresion, as well as that of her husband, that she was able at all times to use the arms. At the same time, this is not an accurate observation, owing to the patient's extreme illness and delirium for three weeks, as above stated.

CASE 4.—Multiple neuritis following abortion and septicemia; death.

History.—Mrs. A. B., the patient, became pregnant about six months after marriage, and suffered excessively from morning sickness. At the end of two months, she had an abortion. Following this was a rise of temperature and general symptoms of infection. The attending physician curetted the patient and removed some portions of the placenta, but evidently did not clean out the uterus thoroughly, because, several days later, a large fragment of decomposed substance was passed per vagina. About a month after this, the patient began to complain of numbness in both the upper and lower extremities, and associated with this was loss of power. There was also some mental confusion and delirium at times.

Examination.—When seen by me, two months later, there was marked wrist and ankle drop. The patient complained greatly of subjective sensations of pins and needles in the feet and hands; she was unable to use the hands to any extent, and there was almost complete loss of power in both legs. She had not been out of bed for two months, and her temperature was between 101 and 102 constantly. There was constant rambling and delirium. The patient slept badly and was in a distressed and unhappy condition constantly. There was no abdominal tenderness or other evidence of pelvic disease. Her condition gradually but steadily grew worse, and she died about a month after I saw her.

CASE 5.—Neuritis following abortion.

Patient.—Mrs. N. R., aged 40, was seen by me April 24, 1900.

History.—She has two children, the youngest of whom is 17. Dr. Robinson of Danville, Va., sent her to me, with the following statement: "In April, 1895, I was called to see Mrs. R., who had been vomiting for some time, from pregnancy, and although she was a woman of extraordinary constitution, it weakened her greatly. I used all the usual remedies, and, failing to give relief, I attempted to bring about a miscarriage by the introduction of the catheter. The vomiting and purging, with the general aspect of the case, appeared septic, and I think the profound inertia of the uterus in non-response to my efforts was also due to sepsis. I finally forcibly dilated and emptied the uterus, not of a fetus, but of a foul-smelling mole. I irrigated with bichlorid solution, and then painted the inside of the womb with iodin and carbolic acid. The septic diarrhea continued, but the nausea ceased and did not return until some effort was made to check the bowels. About a week after the operation, small, deep-seated, septic abscesses appeared in the buttocks and thighs, following the one after the other in regular succession, and finally there appeared paralysis of the extensors of both legs. She was unable to walk for months. She was finally placed under the care of Dr. Bartholow, who treated her for many months. When she returned home, she had improved to the extent of standing with the aid of crutches, but she had no motion nor power in the extensors of the feet. I continued to use hypodermics of strychnia and to apply electricity for a long time, and finally she got able to walk about with her cane." The patient states that hyperesthesia in both legs was a marked symptom at the onset and that for many months they were very tender on pressure. At the beginning, the right index finger was also slightly hyperesthetic, but this soon passed off. She states that there was never any loss of power in the bladder or rectum.

Examination.—On examination, the patient was found to be a well-nourished and a healthy looking woman. She walked quite well and without the aid of a cane, but she was unable to flex the thighs when she walked. She can slightly flex the toes, but cannot flex the feet. Knee jerks were absent.

Electrical examination: Muscles all respond feebly to the faradic current, but there is no reaction of degeneration in the muscles of either the legs or the thighs. Muscles respond fairly well to a strong faradic current. The patient's weight, 171 pounds, seemed to be a factor in her walking, and she was therefore placed on diet to reduce weight.

Treatment.—She was treated by means of faradism, massage and the use of dry heat locally. The patient improved in a very marked degree and recovered a considerable amount of power in flexing the thighs and also in flexing the feet, so that she walked much better after a course of treatment lasting seven weeks. The patient again placed herself under my care in April, 1902. At this time, there was a marked improvement in the electrical reactions, compared with two years previously. There was no reaction of degeneration, and it took from 4 to 8 ma. instead of from 14 to 18 ma. to get response in the anterior tibials and calf muscles. After another period of six weeks' treatment, there was improvement in the muscles of the legs, so that she walked considerably better. There was still slight foot drop in both sides, but this did not interfere with the walk.

Beri-beri or kakke is an epidemic form of multiple neuritis which occurs in Japan, in the Philippines, and in other hot countries. It is a question as to whether it is due to diet or to some form of infection. It seems quite possible that there may be two sources of this epidemic form, as cases have been reported among fishermen and seamen, who have lived for a long while on a scorbutic diet, who have suffered from multiple neuritis, and, on the other hand, an epidemic of this disease has been seen in others who have lived on wholesome food.

Another class of cases is due to some dyscrasia, such as tuberculosis, carcinoma, rheumatism or diabetes. In many cases of rheumatoid arthritis, the muscular atrophy is clearly due to peripheral neuritis.

A short time ago a boy of six years of age was sent to my clinic at the Orthopedic Hospital and Infirmary for Nervous Diseases, as a case of poliomyelitis. There was marked atrophy of the arms and legs, with loss of power of motion and absence of knee jerks. There was, however, great tenderness on any movement, and this led to a close examination of the joints, which were found to be inflamed and swollen, and the child also had a temperature considerably above normal. It was, therefore, decided that the case was one of peripheral neuritis resulting from articular rheumatism.

Starr[1] describes a case of multiple neuritis in a gouty subject.

Cases of multiple neuritis are met with in which infection of some kind is evidently the cause, but exactly what the nature of the infection is cannot be determined. In some cases, it may be due to an autointoxication from gastrointestinal decomposition, and in others it seems to be the result of taking cold. These cases are closely allied to Landry's paralysis, and the diagnosis between this disease and multiple neuritis is difficult or impossible. The only difference between them seems to be that in Landry's paralysis the bulb becomes involved, and in multiple neuritis it does not. The following case is an illustration of this form of multiple neuritis:

CASE 6.—Case of infectious multiple neuritis of unknown origin.

Patient.—E. D. H., aged 17, male, was seen Feb. 6, 1903.

History.—Father died from an acident; mother living and in good health. Several members of the mother's family have had tuberculosis. He had measles, chickenpox and whooping-cough in childhood, but never diphtheria nor scarlet fever. He had never used tobacco, alcohol, tea or coffee, and has always been regular in all his habits. He has worked rather hard since he was 10 or 12 years of age, but does not know of having injured himself by overexertion. In September, 1902, he was seized with a sharp pain in the right hypochondrium, which interfered with his breathing for a short time. He was in bed for two days for this reason, when he was relieved from the pain and was able to get up and go about. Three days later, he was awakened in the middle of the night with violent headache and fever. This continued for five or six days, his temperature being as high as 104 most of the time. On the third or fourth day from the beginning of the fever, he noticed weakness in the arms and legs, and it seemed to him that the muscles were wasted. In the course of a week, the loss of power rapidly increased and at the end of this time he was unable to walk and could use the arms very little. During this time there was no bladder nor rectal incompetency, and there was no pain nor paresthesia in the extremities. He gradually improved and after a month began to walk about and to use the arms a little.

Examination.—He was found to be very thin and generally poorly developed. There was marked anemia. There was general wasting of all of the muscles; the deltoids, more especially on the right, the biceps, triceps and, in fact, all of the muscles of the upper extremities, including marked atrophy of the intrinsic hand muscles. The legs also seemed atrophied but not to the same extent as the upper extremities; the right leg was more atrophied than the left. The muscles of the face, eyes and tongue were not involved. The grip was very weak on both sides, but weakest on the left. Flexion and extension of the forearms was good. The deltoid was completely paralyzed on the right side and the patient was unable to extend this arm; he could raise the left arm from the side, however. The muscular power of the legs was well preserved. He walked without difficulty.

Reflexes: Biceps, triceps and wrist jerks were all absent. The knee jerk was increased on the left side and on the right there was but slight response, but it was re-enforceable. Ankle clonus was absent; cremasteric and abdominal reflexes were present. The pupils were equal and reacted to light and to accommodation. The heart and lungs were normal.

Electrical examination: No reaction of degeneration was found, and there was good response to the faradic current in all of the muscles.

DISCUSSION.

DR. JOHN H. W. RHEIN, Philadelphia, stated that in 1897 he reported a case of neuritis in a woman of 30 who developed, after childbirth, a neuritis affecting the muscles of both arms. Similar cases, however, had been previously reported by Kast, Moebius and others. Although in some cases there is fever, there was none in his case, nor was there present any evidence of puerperal infection. In these cases the onset is usually within two weeks after labor, and the paralysis may be in the distribution of either the brachial plexus or in the muscles supplied by the perineal nerve.

DR. E. B. ANGELL, Rochester, N. Y., reported a case of lead paralysis. A young man, engaged in a tobacco factory, developed the curious habit of chewing lead car seals. He chewed two or three daily for a period of two or three years, when there followed one of the most marked types of lead neuritis Dr. Angell has ever seen. The patient now is quite recovered. Dr. Angell considers that in a great many of these instances, not only does the disease produce multiple neuritis, but that it makes possible neuritis from other causes. He believes that some of the cases, in which arsenic administered for chorea has been regarded as the cause of the neuritis, have been due to the depressing effects of influenza. He mentioned one case of chorea where the child was taking only five or six drops of Fowler's solution three times a day, yet neuritis occurred. He has seen mild cases of multiple neuritis in which vasomotor disturbance was shown by the presence of a slight vesicular eruption. In one case he noticed these spots on the child's fingers, and found that there was some sensory disturbance. As soon as the arsenic was removed the spots disappeared, and in the course of two or three weeks the sensibility was re-established. He saw a case last autumn that came absolutely from cold alone. A farmer had been in the habit of getting down on his knees in doing some of his work. He had been kneeling on the cold ground all day long, from early morning until late at night, and was rewarded by the most serious form of neuritis due to cold Dr. Angell has ever seen. The diagnosis of neuritis was made because the other symptoms were associated with tenderness of the nerve trunks. Since that time the case has become worse, and Dr. Angell is satisfied that there is now some cord involvement.

DR. DAVID I. WOLFSTEIN, Cincinnati, reported a case of difficult diagnosis; for a time he could not decide whether it was a case of articular rheumatism or multiple neuritis without influenza, or influenza accompanied by multiple neuritis. It was further complicated by a very high fever and a valvular heart lesion, which made the diagnosis of articular rheumatism more plausible. However, after going about for a week or two he became nervous and weak and when Dr. Wolfstein saw him he had marked sensory symptoms, also pain along the course of the nerve trunks, and foot drop. After two or three days the symptoms left the leg to a considerable extent, but were present in other joints so much that articular rheumatism was suspected. There was no redness in the joints, but the pain was confined to the joints and to the muscles around the joints. The diagnosis of multiple neuritis complicating influenza was confirmed by the presence of the type of temperature so often seen in influenza, and by the further fact that a week or ten days afterward he was taken with double catarrhal pneumonia, so that Dr. Wolfstein thought his diagnosis was justified and that articular rheumatism could be excluded, notwithstanding that there was also present a valvular lesion of the heart. He has seen several cases of the sensory form of neuritis following influenza.

DR. T. H. WEISENBURG, Philadelphia, stated that, as an army surgeon, he spent several years in the Philippines, where he had abundant opportunity to study beri-beri. There are three forms, the dropsical, where the extremities are much swollen and all the serous cavities are filled with fluid; the dry form, where there is much atrophy combined with all the symptoms of multiple neuritis, and lastly, the mixed type, which combines the symptoms of the first two. It is impossible to obtain many autopsies. The etiology of the disease is still very much in doubt. Manson regards it a place disease, that is, the infection is caused by a toxin which is generated by a germ living in the patient's surroundings. This, probably, is the true explanation, for it is common to see in prisons the infection localized to certain localities. Rice and fish diet have also been given as a cause, but this, probably, is not so, for beri-beri exists where rice and fish diet are not exclusive.

DR. C. C. HERSMAN, Pittsburg, Pa., said that it is possible that beri-beri has its nidus in the soil. Some writers on leprosy also claim that leprosy has its nidus in the soil. Dr. Hersman has seen one patient (a young man), who was so helpless that, if sitting on the floor, he was unable to rise, make a complete recovery. He has seen one case of multiple neuritis following a large dose of arsenic (rough on rats), which the woman had taken with suicidal intent. She developed multiple neuritis, extending to all the extremities, leaving her almost helpless, from which she made a good recovery after several months.

DR. WHARTON SINKLER, Philadelphia, declared that it is more than probable that the case to which Dr. Moore refers was due to an infection from the abscess in the right iliac

region. Whether that was salpingitis or appendicitis he is, of course, unable to say, as he did not see the patient until six months after the onset of the neuritis. Dr. Swan, with whom Dr. Sinkler saw the patient, did not see her at the time of the onset of the trouble, as she was not from Philadelphia, but from many hundred miles away.

A CLINICAL STUDY OF HEMIPLEGIA IN THE ADULT.*

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PHILADELPHIA.

(From the Philadelphia General Hospital.)

There is no organic nervous disease more common than hemiplegia or a disease of which there has been more written, and yet the study of hemiplegia is always interesting and profitable. Advantage was taken of the excellent opportunities offered by the nervous wards of the Philadelphia General Hospital to make a study of hemiplegia. A number of cases were also studied in the nervous services of the University and the Polyclinic hospitals.

In all 160 cases were observed. Particular attention was paid to the following subjects: Heredity, prehemiplegic and posthemiplegic pain, atrophy of the muscles of the paralyzed and of the sound side, respiration, the various trophic phenomena, as edema and the arthropathies, vasomotor disturbances and hemichorea.

Of the 160 clinical cases, only 109 were considered in the study of heredity, prehemiplegic and posthemiplegic pain and sensation, because of the unreliability of some of the statements or the aphasic conditions. All of the cases were in the adult.

A greater portion were in the male sex, but the conditions were such that it was hardly fair to draw conclusions regarding the frequency of the disease in the sexes. It is, however, well recognized that hemiplegia occurs more often in the male than in the female. Of the 160 cases, 97 were right-sided. This proportion is, perhaps, not so great as one would expect, for most writers insist on the preponderance of right-sided hemiplegia.

HEREDITY.

Hereditary predisposition for hemiplegia in certain families has been observed, and it probably depends on a tendency to inherit a diseased condition of the blood vessels. Fourteen of the 109 cases gave such a history. In five the mother had hemiplegia, in five others the father, in one case both of the parents died of a stroke, in another the grandfather and the father had hemiplegia, while in two cases the grandmother and the mother each died of apoplexy.

Dr. Wm. G. Spiller has very kindly furnished me the details of a most interesting history of a patient who recently had a slight hemiplegia. Eight brothers and sisters of the patient's mother died of apoplexy, but his mother did not. The mother of the patient's mother also died of apoplexy. The patient himself has had two children, both of whom are living and well. This is a very extraordinary family history and shows how strongly the hereditary tendency may be. I have been unable to obtain the details of a similar instance in the literature.

In the histories obtained of most of these patients, a number of other children in the families were said to be healthy. It is necessary, therefore, to have an active contributory cause. It can be assumed that in the first ten cases the occurrence of hemiplegia in either the father or the mother was accidental, but in the last five instances the hereditary tendency was strongly manifest, especially in the last instance. There was neither a special tendency for the paralysis to involve the same side in the parent and the child, nor involve the same sex.

PREHEMIPLEGIC PAIN.

Weir Mitchell,[1] in 1893, called attention to the occurrence of prehemiplegic pain. He then recorded three such cases. In one the pain appeared two years before the onset of the hemiplegia and was violent in character. This patient had three strokes, all of which were preceded by pain. In another case the pains were accompanied by a painful swelling of the joints. Subsequently there was a cerebral hemorrhage and a resulting hemiplegia on the same side as the pains. The joint lesions persisted. Férre,[2] in a study of 126 cases of hemiplegia, found that 14 had prehemiplegic pain.

Seventeen cases of the 109 had pains of varying character before the onset of the hemiplegia. Of these in seven instances the pain was described as a violent, shooting, cutting pain, in two as a dull, aching feeling, and in five as a tingling, tired, numb, or a pins-and-needle sensation. In all these cases the pains occurred on the side of the subsequent paralysis, in one instance, as in Weir Mitchell's case, two years before, in another one year before, and in others six, three and two months respectively before the onset of the hemiplegia. Except in the above cases the pains were mostly felt for from twenty-four to forty-eight hours before or just before the onset of the paralysis. One patient complained of sharp, persistent headache for six months, another of a feeling like an electric shock just before his stroke.

The pains were manifested mostly in the muscular tissues and the articulations of the upper extremity, and less often of the lower extremity. Sometimes they were present in the chest and side of the face. In one instance the pain was present for six months only in the distribution of the sciatic nerve. Férré records three similar cases. In another case of an intelligent physician they were localized to the distribution of the median nerve for two days. Dr. A. S. Hamilton, of the Independence State Hospital of Iowa, has kindly furnished me with the record of a most interesting case of a man who was "aroused by something he knows not what, and almost immediately afterward it seemed to him as if an explosion had occurred very close at hand. He heard a terrific noise and saw a bright flash and at the same time felt as if he had been struck a very heavy blow in the side of the head. This was the beginning of an apoplectic seizure. About two hours after his stroke he became conscious, and since has persistently given the above facts."

In five of these cases the pains ceased after the onset of the hemiplegia. The pains occurring with hemiplegia are undoubtedly of cortical origin and several theories have been advanced to explain them. It has been thought that the congestion of the cerebral vessels which is supposed to precede the attack may be the

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* Read in the Section on Nervous and Mental Diseases of the American Medical Association, at the Fifty-fifth Annual Session, June, 1904.

1. Weir Mitchell: Medical News, p. 421, 1893.
2. Férré and Brissaud: Quoted by Marie, P., Hémiplégie, in Traité de Médecine et de Therapeutique, vol. viii, Paris, 1901.

cause. It is not to be denied that there may be cerebral congestion previous to an apoplectic attack, but it has seemed to me from the study of these cases that the so-called premonitory symptoms, as headache, fullness of the head, roaring in the ears and dizziness, are, on the whole, not so common as described. Most of the attacks come on without the slightest premonitory symptoms, either while the patient is at rest, or, as in a large number of cases, during sleep.

Brissaud has explained these pains by an involvement of the meninges. This may be a satisfactory explanation for those cases in which the pains occur for some time before the onset of the hemiplegia, for in all of my cases in which the pains occurred for some time before the attack, in five, the pains persisted with equal severity after the attack began. In five of the milder instances, those in which the pains occurred one or two days before, they ceased after the attack began. In these cases and for the other similar ones in which the pain persisted it may be that cerebral congestion, or rather an actual small hemorrhage in the region of the sensory pathway, would explain the condition. No satisfactory explanation can be given, however, for the occurrence of pains limited to one nerve, as the sciatic, unless this was an accidental complication, probably a neuritis.

Still another explanation may be given. It is possible that in a hemiplegia due to a thrombosis a gradually diminishing blood supply to a part of the cortex would cause nutritional disturbance, which would account for the pain. In the cases under consideration, however, this did not seem to be the explanation.

POSTHEMIPLEGIC PAIN.

Hemiplegia can be said to be a painful disease. It is rare, indeed, for a person suffering from this affection not to complain of some form of ache or pain. In the 109 clinical cases studied, twenty-seven had distinct pain of a sharp, shooting character, twelve of different forms of paresthesia, and the other seventy patients complained of soreness in the muscles and joints of the paralyzed side, and in only five of the series was there no pain or ache complained of.

A subdivision may be made of these pains according to their character. In the largest class belong those persons in whom there is an uneasiness or feeling of soreness in the various joints and muscles of the paralyzed side, especially of the shoulder joint. This is not so apparent in the hemiplegics where there are little or no contractures, or where the spasticity is not marked, but in the patients in whom these conditions are prominent there is always some pain on movement. Then, again, there is the pain which is due to the weight of the arm dragging on an ankylosed joint.

A second subdivision may be made for those cases in which the patients complain of the different forms of paresthesia, as a feeling of tingling or numbness, a "growing" or a dull feeling, or an itching sensation. These may be present either in the whole affected side or only in the distal parts of the extremities. Twelve of my cases showed these phenomena. In the marked instances there was always an accompanying hypesthesia of the affected side either for touch and pain or for both. There are several explanations for these symptoms. Lessened blood supply and a consequent nutritional disturbance, and at times accidental injuries causing a neuritis, as by dragging of a limb, are very often the cause, but they are doubtless sometimes due to a cortical or subcortical lesion, especially in the cases where there are accompanying sensory changes.

In the third subdivision may be placed the pains of the more severe type. These are variously described as sharp, shooting, cutting, aching, twisting and so forth. Of the 109 cases, twenty-seven had more or less severe pain. These were mostly present in the upper extremity, and were more marked in the cases where ankylosis was extreme. They did not bear a special relation to the degree of atrophy present, as Brissaud and lately Marie have held.

I did not make any special study of the state of the sensation in the paralyzed side, but the following conditions were noted: There were two cases of total hemianesthesia for all forms of sensation and twenty-eight cases of hypesthesia for either touch or pain or both. Of these thirty cases, eight had little or no pain, five complained of paresthetic phenomena and seventeen of various pains. It may be said, therefore, that pain in hemiplegia is more liable to occur where there are sensory changes.

The pains were present mostly from the shoulder to the wrist, and from the hip to the knee and sometimes to the ankle. Again, they were at times manifested in the side of the chest. In most of these instances movement did not increase the pain. Diminished vascular supply, spasticity and sometimes an accompanying neuritis explains many of these conditions, but in a number of my cases the pains were undoubtedly due to a central origin.

It is my intention to take up the subject of central pain in a subsequent paper where posthemiplegic central pain will be more fully discussed.

RESPIRATION.

Hughlings Jackson,[3] in 1891, called attention to the fact that in the respiratory movements of hemiplegics the superior intercostal muscles of the paralyzed side have a greater amplitude in quiet or automatic respiration, but that in forced or extraordinary respiration the movements on the sound side are always greater. Since that time these observations have been confirmed, and lately by Clarke[4] and Bury.[5] Gowers,[6] however, does not think that there is any difference in the respiratory movements, and Boeri[7] believes that in most instances the respiratory movements are held back not only in quiet, but also in forced respiration.

In nearly every case of the 160 examined I was able to confirm Jackson's observation that in quiet or ordinary respiration the upper part of the chest of the paralyzed side expands more than does the corresponding part of the sound side, but that in forced respiration the movements on the sound side are always greater. The movements vary in different patients, sometimes the difference being hardly perceptible. The observation is made while the patient is either standing or sitting.

I have, however, observed that at the end of ordinary or quiet expiration the chest on the sound side has a longer range of movement, that is, that it retracts more than does the chest on the paralyzed side. If the patient is asked to lie down, this phenomenon is shown even more distinctly. Dr. Spiller was good enough to confirm this observation. This being so, it means that the amount of air expelled from the lung on the sound

3. Jackson, Hughlings: The Lancet, Jan. 14, 1893.
4. Clark, L. P.: Am. Jour. Med. Scien., December, 1903.
5. Bury: The Lancet, Dec. 19, 1903.
6. Gowers: Dis. of Nervous System, pp. 75, 89, vol. II.
7. Boert: Gaz. Hebd. de Med., No. 7, p. 73.

side is greater, that there is more remaining residual air at the end of expiration in the lung of the paralyzed side, and that the movement of the lung is actually weaker on the affected side.

If the lungs are percussed at the end of expiration, the note obtained on the paralyzed side is always deeper.

The amount of air breathed in during the inspiratory act is probably the same in either lung, but the lung on the hemiplegic side has to accommodate the same amount of air as the healthy lung, plus the increased quantity of residual air, hence the increased superior intercostal excursion. In forced respiration the diminished respiratory movements of the lung of the paralyzed side are easily seen. We must come to the conclusion, therefore, that both in quiet and in forced respiration the respiratory movements are diminished on the paralyzed side of the body.

The usual explanation offered has been the loss of the cortical inhibitory control over the medullary respiratory centers, and, as a result of this withdrawal of inhibition, the medullary center overacts in ordinary or automatic respiration.

It is well known that movements, not muscles, are represented in the cortex, and it may be expected, therefore, that in a lesion, such as would result in a hemiplegia, there would be total loss of function on the opposite side. That this is not so in muscles, which habitually act together, as in the elevation of the brow, in respiratory and laryngeal movements, is well known. Broadbent has explained this by the hypothesis that such functions are represented in both sides of the brain, and that in destruction of one cortical center the movements are controlled by the remaining center. This explanation has been generally accepted.

It is a fact, however, that the function of the muscles on the side opposite the lesion are always somewhat impaired, as, for instance, in looking upward, the brow on the affected side is not wrinkled so much, nor can a hemiplegic shut the upper eyelid alone on the affected side. It is to be expected, therefore, that the function of the respiratory muscles on the paralyzed side should be diminished.

The explanation of loss of inhibitory control is a purely theoretical one. We do not really know what loss of inhibition means. It is much more logical to believe that in a lesion, such as would result in hemiplegia, there would be loss of function of the opposite side, but that in bilateral functions, instead of a paralysis, there would be only a paresis of function, consequent to the still remaining cortical control of the sound side.

EDEMA.

A slight amount of edema in hemiplegia is not a rare condition. Mills,[8] in a study of sixty cases, found edema in seven. In only two cases did I find a great deal of edema. Allen[9] recently reported a case of extensive edema of the paralyzed side and was only able to collect three similar cases in the literature, those of Hare,[10] Preobrajensky[11] and Gilbert and Garnier.[12] In Hare's[10] case the edema was limited to the upper extremity and was sharply defined, there being a line of demarcation. Preobrajensky's case was complicated by an aneurism of the aorta and thrombosis of the vessels, while in Gilbert and Garnier's[12] case the edema was limited to a "succulent" hand.

The following history of a patient with intense edema of the paralyzed side is, therefore, of interest:

Patient.—S. B., aged 52. The family history is unimportant. Had syphilis twenty years before his stroke.

History of Attack.—Three years ago, without any symptoms of illness, he suddenly had an apoplectic attack which rendered him unconscious. Since that time he has had a left hemiplegia. Directly after his attack the whole paralyzed side became swollen, this being marked on the side of the face and chest, the swelling fading away as the median line was approached. The upper extremity was more swollen than the lower. The skin looked shiny and tense and there was no pitting to pressure. At the same time the joints of the affected side, especially the wrist and elbow joints, became much swollen and exceedingly tender to the slightest pressure. This edema gradually disappeared, leaving, however, a swelling of the elbow and wrist joints.

Subsequent History.—Examination three years after shows a left hemiplegia, with hardly any edema; the joints mentioned, however, are still a little swollen. Examination of the urine shows albumin, but no casts.

Two other cases were observed where the edema was confined to the paralyzed hand, giving it the appearance of a "succulent hand," similar to the case reported by Gilbert and Garnier.

No definite explanation has been given for this phenomenon. Vasomotor disturbance probably plays an important rôle, but it does not explain why in some cases we do have edema, no matter how slight, and not in others. It is probable, as has been pointed out, that any tendency to edema will be increased by an accompanying nephritis. This has recently been called attention to by Spiller.[13]

VASOMOTOR DISTURBANCES.

Vasomotor disturbances are very common in hemiplegia. The patient usually complains of a feeling of coldness in the paralyzed limbs, and very rarely of a feeling of warmth. It is not uncommon to see a blue condition of the paralyzed extremities brought on by the lessened circulation. Such phenomena, however, as a hemi-skin eruption and sweating are rare. A patient who had a hemiplegia of some years' duration called my attention to the fact that he did not perspire on the paralyzed side and, more curiously still, that the affected side of the face and arm did not tan in the sun so much as the healthy side. Another patient had an eczematous skin eruption which was limited to the paralyzed side.

POSTHEMIPLEGIC CHOREA.

The occurrence of various disorders of movement after an apoplectic attack are rare. Von Monakow[14] states that in twelve years he saw only two cases of posthemiplegic chorea. Spiller[15] states that he never saw a true instance of posthemiplegic chorea in an adult, and it has seemed to him that the term posthemiplegic chorea is a bad one, for the movements are not choreiform in character. Gowers[6] also calls attention to this, and does not use the term posthemiplegic chorea, but speaks of the various disorders of movement following hemiplegia. Marie also has recently spoken of the infrequency of posthemiplegic chorea.

A number of explanations have been offered for these phenomena. Charcot[16] was the first to call attention to

8. Mills: The Nervous System and Its Diseases, p. 583.
9. Allen: Jour. of Nerv. and Ment. Dis., p. 471, 1899.
10. Hare: Jour. of Nerv. and Ment. Dis., p. 189, 1898.
11. Preobrajensky: Ref. in Révue Neurolog., p. 73, 1897.
12. Gilbert and Garnier: Comptus rend. de la Soc. de Biol., 1897.
13. Spiller: Prog. Med., p. 201, 1900.
14. Von Monakow: Gehirnpathologie, 1897.
15. Spiller: Amer. Med. Assn., 1904, Proceedings Section of Neurology.
16. Charcot: Quoted by Bonhoeffer, Monatsch. f. Psych. und Neurologie, vol. I, No. 1.

this symptom and thought that there was in the internal capsule in the region of the *carrefour sensitif* a certain tract, a lesion of which would cause choreic movements. Kahler and Pick[17] thought that an irritation of the pyramidal tracts anywhere would explain the condition. Gowers[6] is of the opinion that these symptoms are caused by a lesion of the optic thalamus. Bonhoeffer has, perhaps, given us the best explanation. He believes that a lesion involving the anterior cerebellar peduncle of its continuation into the subcortical ganglia causes disorders of movement. Since Bonhoeffer's[18] paper other cases have been reported which support this observation.

The following case is of much interest in this connection:

Patient.—J. E., aged 63.

History of Attack.—In September, 1899, the patient had a slight stroke which affected his left side. He improved somewhat, but had a second attack two months afterward. It was not until two months after the second stroke that he developed an irregular movement of his left arm. His condition at present is practically the same, except that the irregular movements have become worse and have involved all of the limbs.

Subsequent History.—The last examination of the patient by Dr. Spiller is as follows: Power in the left upper and lower limbs is diminished, and these limbs are distinctly weaker than those of the right side. All the reflexes in the left side are increased, and Babinski's sign is present. The reflexes on the right side are normal. Sensation for touch and pain is diminished over the left upper and lower extremities. The patient has no knowledge where his left upper limb is, and, to find his left hand, he has to put first his right hand on the left shoulder. The sense of position is also lost in the toes of the left foot. He does not recognize a pencil, a key and a watch in his left hand, calling these objects a crucifix, but at other times he recognizes objects properly. There is marked ataxia of his left upper limb. The tremor in his left upper limb varies in intensity from time to time, sometimes it is only a movement from the shoulder, at other times the whole upper limb is involved. The movement is chiefly a lateral one from the shoulder, but there is at times a rotatory, flail-like movement. There is some tremor of the right upper limb at times, but it is much less important than that of the left upper limb. There is occasionally a tremor of both thighs, especially the left, consisting of a flexion and extension of the hip.

We have in this case a left hemiplegia of five years' duration, where, besides the ordinary symptoms, there are hypesthesia for touch and pain, ataxia, loss of the sense of position, asteriognosis, and a violent irregular movement of the affected upper limb, with milder movements of the other limbs. It is impossible to test him for hemianopsia, as he lost the sight of both eyes some years ago. A lesion in the parietal area would explain all of these symptoms, except the irregular movements. These movements probably are not hysterical, for suggestive treatment and static electricity have had no influence on him for the past five years.

A lesion involving the superior cerebellar peduncle and the posterior limb of the internal capsule would easily explain all the symptoms, and would correspond to Bonhoeffer's view. The slight tremor of the opposite side could be explained by a partial involvement of the other superior cerebellar peduncle.

The tremor which is present in this case could hardly be called choreiform in character. This was the only instance in which this symptom was observed in the series studied.

17. Kahler and Pick: Vierteljahrschrift f. Praktisch, Heilkunde, Prag., 1879.
18. Bonhoeffer: Monatschr. f. Psych. and Neurolog., vol. I, No. 1.

Dr. A. J. Smith has kindly furnished me with the record of a case of hemiplegia where violent movements occurred preceding the apoplectic attack. In this instance the movements were confined to the left arm and the left leg and the lower part of the face on the left side, the tremor being clonic in character, resembling a Jacksonian convulsion. This lasted for about two hours, after which there was a complete left-side hemiplegia.

Such convulsions, while not uncommon in uremic conditions, are rare in organic hemiplegia. Various disorders of movement are liable to occur preceding an apoplectic attack, but we rarely have the opportunity to observe them.

CEREBRAL MUSCULAR ATROPHY.

A great deal has been written concerning atrophy of the muscles in hemiplegia, and yet the cause of this atrophy still remains in doubt. It has been said that atrophy accompanies every case of hemiplegia, that it is not a complication but a symptom. Lately Marinesco[19] and Steinert[20] have confirmed this observation. In my own cases I also found that atrophy was present in every case. The degree of atrophy varies in different cases, sometimes coming on very early after the onset, and again not for some months.

The atrophy probably first manifests itself in the small muscles of the hand and in the muscles of the shoulder, it being, perhaps, more easily seen in the latter situation because of the bulk of the muscles and the bony prominences. It is more marked in those cases in which the paralysis is marked, and, as it has been pointed out by Mills,[8] it is greater in the distal part of the extremity. The lower limb is never so much affected as the upper limb. In the majority of cases sensory changes were found, this agreeing with other observers. In quite a large number of my cases considerable atrophy was also observed on the so-called sound side.

Charcot[21] in 1874 recorded his classic case of atrophy in hemiplegia, where microscopically secondary degeneration and atrophy of the cells of the anterior horns of the spinal cord was found. Since then his observation has been confirmed by a number of investigators. This has not been accepted, however, as an explanation for the atrophy, because later methods have failed to show atrophy of the cells of the anterior horn.

Borgherini,[22] Quincke[23] and Eisenlohr[24] believe that the atrophy in hemiplegia is due to an alteration of the trophic centers in the brain, these centers being situated either in the cortex or near the optic thalamus.

Darkschewitsch[25] and later Gilles de la Tourette[26] believed that the arthropathies which are so common in hemiplegia were the sole cause of the atrophy.

Steiner[27] thinks that there must be a congenital predisposition to disease in the cells of the anterior horn, for, he says, there is not atrophy nor alterations in the cells of the anterior horn in every case.

Roth and Muratow[28] believed that a destruction of the vasomotor tracts caused a disturbance of the blood supply to the muscles, thereby interfering with the

19. Marinesco: Semaine Méd., Nov. 23, 1898.
20. Steinert: Deutsch. Zeitschr. f. Nervenh., vol. xxiv, 1903.
21. Charcot: Lec. sur les localisations, Oeuvres compl., vol. iv.
22. Borgherini: Arch. f. klin. Med., vol. lxv, Nos. 5, 6.
23. Quincke: Arch. f. klin. Med., vol. xlii, p. 492, 1888.
24. Eisenlohr: Neurolog. Centralbl., 1891.
25. Darkschewitsch: Neurolog. Centralbl., 1891.
26. Gilles de la Tourette: Soc. Méd. des Hôpitaux, 9, 4, 1897; ref. in Semaine Méd., 1897, p. 130.
27. Steiner: Deutsch. Zeitschr. f. Nervenh., vol. iii, p. 280.
28. Roth and Muratow: Ref. Archiv. de Neurologie, p. 300, 1891.

nutrition and causing atrophy. Lately Luzzatto[29] has supported this view. Marinesco[10] thinks that normally the pyramidal tracts carry vasomotor impulses which act on the medullary center of the sympathetic system, and that in a hemiplegia these influences are destroyed, and there is a consequent stasis in the blood vessels, a lessened blood supply and atrophy. Oppenheim[30] and Von Monakow[14] also support the vasomotor theory.

Steinert[27] has very recently supported the theory that atrophy in hemiplegia is the result of the trophic influence of one neuron upon another. He believes that the cortico-spinal motor tract or the upper neuron has a direct influence on the lower neuron, and that in a lesion of the former there should be alterations in the latter.

ARTHROPATHIES.

Recently Marie[2] defined for us what is to be understood as an arthropathy in hemiplegia. It is, according to him, a disturbance of function in the articulations of the paralyzed side, especially of the shoulder; the voluntary movements are very limited, and pain is caused by the attempt to move the limb passively, but there is neither reddening nor tumefaction except, perhaps, in some tendinous sheaths.

That this condition was not quite understood by the older writers is evident by the description of Charcot,[31] according to whom the arthropathies of hemiplegia are a late manifestation and are characterized by pain of greater or less intensity closely resembling the painful crises of rheumatism, and are accompanied by reddening of the skin, tumefaction of the articulations, with an increase in the synovial fluid.

Weir Mitchell[1] described a similar condition, but in his case the painful swelling of the joint came on four days after the onset of hemiplegia. The same author also described a painful condition of the joints preceding the attack of apoplexy.

Marie does not consider these as pure nervous arthropathies, but as arthrites of probably infectious origin, and he further justly remarks that there is no resemblance between these neurospinal arthropathies and the simple arthropathies so common in hemiplegia, and that at the autopsy one finds in the latter only a slight degree of synovitis without lesion of the cartilages, but marked participation of the synovial tendon sheaths.

I have found in only one case the arthropathy Charcot speaks of, viz.: in the patient previously referred to, when discussing edema. This man, a few days after his seizure, had great edema on the paralyzed side with marked swelling of the elbow and wrist joints and a lesser involvement of the shoulder joints. These joints were very painful and tender to pressure, the skin was reddened and there was tumefaction of the articulations. The joints of the lower extremity were not involved. The pain persisted about one year, and at present, three years after the attack, there is still a swelling of the elbow and wrist joints, it being possible to move the articulations in any direction.

I have observed still another patient, in whom it was possible to move the wrist and all the finger joints freely in any direction. This woman gave no history of pain nor tenderness in the affected parts, but said the flexibility came on gradually. In two more instances I have observed a similar condition in the articulations of the fingers only.

It may be that the painful joints spoken of by Charcot and also present in one of my cases are caused by an infection. It has seemed to me, as Gowers[6] has already pointed out, that there is an analogy between this condition and the similar inflammation which is secondary to acute myelitis.

There is also a similarity between the painless arthritic conditions present in three of my cases and the arthropathies found in chronic spinal diseases.

In the majority of hemiplegias we find the condition described by Marie. The shoulder joint is usually most affected, but in cases where the contractures are marked all of the joints may be involved. Many theories have been advanced to explain the cause of these arthropathies. Charcot and Joffroy believed that they were due to a secondary alteration in the cells of the anterior horns; Hitzig,[32] to the pulling on the articulations and the tendons by the weight of the paralyzed extremities; Gilles de la Tourette,[33] to the forced immobility; Marinesco,[34] to vasomotor disturbances, and by others to rheumatism.

Most probably the cause can be ascribed to the forced immobility plus the pulling on the articulations and tendons by the weight of the paralyzed member. Alterations in the cells of the anterior horns are not common in hemiplegia. I have examined the cells of the anterior horns in eight cases of hemiplegia. In most of these there were marked contractures and arthropathies, without finding any pathologic changes. Spiller[35] reported a very interesting case of unilateral internal hydrocephalus, where the contractures were very marked, but the cells of the anterior horns of the spinal cord were perfectly normal. Vasomotor disturbances probably play no important rôle in these arthropathies and there is no reason to expect a greater tendency to rheumatic conditions in hemiplegia than in other organic nervous diseases.

This paper will be followed by a pathologic study of hemiplegia.

I am indebted to Drs. Wm. G. Spiller and Chas. S. Potts for the privilege of studying their cases and to Dr. G. Walter, the resident physician, for her assistance.

DISCUSSION.

DR. GUY HINSDALE, Hot Springs, Va., stated that some cases of hemiplegia which he has seen have been accompanied by the rather curious feature of yawning. At the same time there is a decided tendency to move the paralyzed arm and the paralyzed leg. He has never been able to understand why the process of yawning should start motion in the paralyzed limb, but supposes that it is reflex, though the movement is not a sudden, quick movement, as seen in the knee jerk, but is a much more deliberate one, such as putting the hand up to the head and down again.

DR. HUGH T. PATRICK, Chicago, asked whether the pre-apoplectic pain in the paralyzed parts occurred previous to thrombotic or hemorrhagic apoplexy. If that pain precedes the development of the apoplexy from the hemorrhage, then he does not understand it all. If it precedes the thrombotic variety, then it seems to him that it is quite naturally in line with other symptoms. Dr. Patrick said that, according to Hughlings Jackson, in using the extremities on one side the action of the trunk muscles is more especially on the opposite side. For instance, using the muscles of the right arm naturally produces as a balancing factor a contraction of the trunk muscles on the other side. In carrying a pail of water or in lifting, the resistance must be on the side of the trunk opposite

29. Luzzatto: Deutsch. Zeitschr. f. Nervenh., vol. xxiii, 1903.
30. Oppenheim: Lehrbuch der Nervenkrankheiten, 3d ed., p. 612, 1902.
31. Charcot: Quoted by Marie.
32. Hitzig: Quoted by Marie.
33. Gilles de la Tourette: Nouv. Iconoge., p. 287, 1897.
34. Marinesco: Revue Neurolog., No. 14, 1894.
35. Spiller: Am. Jour. Med. Sci., July, 1902.

to the extremity used. Consequently the muscles of the trunk are involved with the muscles of the extremity on the opposite side. Dr. Patrick asked whether in cases where the pains and tenderness were greater above or below, showed any variation in regard to the degree of the paralysis. Ordinarily the paralysis is greater at the distal end of the extremity, but there are cases in which the paralysis is greater at the shoulder than at the fingers.

DR. THEODORE DILLER, Pittsburg, Pa., declared that this study offers another evidence of a fact that is sometimes lost sight of, viz., the very intimate association between sensory and motor functions. He is not sure but that if other so-called pure motor diseases were to be investigated in the same fashion there would be a greater amount of evidence than is now possessed as to the existence of sensory phenomena. For instance, in paralysis agitans there are sensory phenomena and in the muscular dystrophies and atrophies they are sometimes present. Landry's paralysis is spoken of as if it were a pure motor disease; and yet the studies of recent cases (within the last five years) have shown that sensory phenomena nearly always precede or accompany the motor manifestations. Dr. Weisenburg called attention to this fact in a paper published two or three years ago. He went over the published cases very carefully, and found that sensory phenomena were nearly always present. He doubts whether any of the so-called motor diseases are entirely free from sensory signs or symptoms.

DR. DAVID I. WOLFSTEIN, Cincinnati, stated his experience with the Babinski sign, namely, the extreme rapidity with which it comes on, and its usefulness in enabling the physician to make a positive diagnosis when coma is present, or where paralysis has occurred. In a case which occurred at 5:30 p. m., and which he saw at 6:30 p. m., the Babinski sign was marked. In another case which occurred at 9:30 and which he saw at 10:15, the Babinski sign was present, and in another case, in which he was in doubt, the diagnosis was confirmed by the presence of the Babinski sign.

DR. F. E. COULTER, Omaha, Neb., stated that he saw a case of undoubted fracture of the base of the skull very soon after the accident occurred. There was complete coma and hemorrhage from both ears; the patient died, but no postmortem was allowed, and it was difficult to determine the exact location of the lesion. The Babinski sign was present on both sides within three hours from the time of the accident.

DR. FRANK P. NORBURY, Jacksonville, Ill., stated that a physician, who was associated with him for a number of years in hospital work, had hemiplegia about four years ago and died in apoplectic coma. His father died a victim of hemiplegia, as did also his grandfather, which made three cases in direct succession occurring about the same age. This patient lived about four years after the onset of the hemiplegia before he died. He also presented the phenomena of which Dr. Diller has spoken, edema on the right side.

DR. ALBERT E. STERNE, Indianapolis, inquired whether Dr. Weisenburg had made any observations on the temperature of the body one either side, and whether there was any perceptible difference in temperature between the two sides of the body. It is certain that in cases observed shortly after the apoplectic attack the temperature on the paralyzed side rises, frequently showing a difference of a full degree.

DR. ARTHUR CONKLIN BRUSH, Brooklyn, N. Y., thinks that a good deal of importance should be given to these feelings of weakness and numbness, especially in women over 45, as he has learned from experience that they often precede an attack of cerebral thrombosis. He has never noticed them before a cerebral hemorrhage; but in these cases these premonitory symptoms are often replaced by pain.

DR. H. G. BRAINERD, Los Angeles, Cal., stated that some years ago he had an opportunity of holding postmortems on two cases of hemiplegia which were accompanied by great hemiplegic pains. One was the case of a young woman who had hemiplegia occurring during her menstrual period. There were no cardiac lesions found, either during life or after death, and he concluded that the source of the clot might have been from the endometrium. She had a left-sided paralysis with intense pain in the arm and some in the leg. The lesion was found in the internal capsule posteriorly. The other case was that of a woman, aged about 60, who had a cerebral hemorrhage into the disturbed area about the same part of the capsule, most marked posteriorly. In other words, there was an irritation of the fibers between the cortex and the periphery causing "referred pains." Dr. Brainerd remembered being called one morning to see a man who had a slight seizure: what little aphasia there was soon passed off. The patient said: "I shall go in the next succeeding one; my father died from apoplexy; his father died from apoplexy, and his father died from apoplexy." A few weeks later his prediction came true, making four successive generations in which death from apoplexy occurred.

DR. T. H. WEISENBURG, in reply to a question, stated that he did not observe the yawning spoken of and that most of the cases were hemorrhagic in character. In the case of bone pain, where the pain was more marked in the upper arm than in the hand, the degree of paralysis was greater in the hand. Out of 109 cases studied, only 30 showed sensory disturbances. He has also observed the Babinski sign within 24 hours after the onset of the hemiplegia and in a case of uremic hemiplegia within 12 hours. In 3 out of the 149 clinical cases studied, the Babinski sign was not obtained; this is not remarkable, however, for Babinski himself states that this reflex may not be present in every organic case. In two cases, with autopsy, where the hemiplegia was caused by lesions of the pyramidal fibers in the pons. The Babinski sign was not obtained. He did not make any study of the difference of the temperature on the paralyzed and the sound sides, but Dr. Mills in his book gives a very careful study of this phenomenon in 60 cases. He found the temperature to be diminished in almost every case on the paralyzed side.

A CASE OF LOCOMOTOR ATAXIA WITH A TREMOR RESEMBLING THAT OF PARALYSIS AGITANS.*

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(From the William Pepper Laboratory of Clinical Medicine and the Philadelphia Home for Incurables.)

At a session of the American Medical Association in June, 1902, I reported three cases of involuntary movements in ataxia. Since that time one of these patients has died, and I was fortunate enough to obtain an autopsy. The case was one in which a tremor of both arms existed from the early stages of the disease. This tremor was like that of paralysis agitans.

Patient.—A man, aged 57; family history good. He himself had always been healthy, having never had any serious illness of any sort, and has always been temperate in alcohol and tobacco.

History.—In 1883 he contracted syphilis. The first tabetic symptoms consisted of the characteristic pains of ataxia, from which he suffered for nine years before the other symptoms of the disease made their appearance. Then there gradually developed numbness of the hands, unsteadiness in walking, and the tremor in both hands before referred to. The ataxia gradually increased until in February, 1898, it had become so intense that he could not walk at all, even with assistance.

Examination.—When I examined the patient for the first time, in May, 1898, he was greatly emaciated. He was unable to stand, and every effort at voluntary movements of the legs developed intense ataxia. There was also a marked degree of ataxia of both arms. On the side of the sensory symptoms

* Read in the Section on Nervous and Mental Diseases of the American Medical Association, at the Fifty-fifth Annual Session, June, 1904.

there were the characteristic changes of locomotor ataxia. His pain sense was greatly diminished in both legs; he confused heat and cold; and deep pressure was not always recognized. Moreover, he complained of a pronounced pressure sensation over his bladder, and of intense lightning-like pains in his limbs. There was incontinence of urine and he was very constipated. The Argyll-Robertson pupil was present and the discs were gray. The heart and lungs were not conspicuously diseased, and the examination of the urine was negative.

The symptom which makes the case interesting and unusual was the presence of a fine rhythmical tremor of both hands and arms. The pill-rolling position of the fingers was well illustrated. Voluntary effort temporarily quieted this movement, after which it became more intense. It was absent during sleep and was helped by rest. After muscular effort in one hand the tremor was first quieted and then increased. There were no other symptoms of paralysis agitans. The mask-like face was absent, as well as the stiffness and contractures. The patient died from apoplexy.

Autopsy.—The autopsy revealed the presence of a large hemorrhage into the right lateral ventricle. The spinal cord, brain, peripheral nerves, muscles and ganglia were removed and hardened in formalin for study. The cortex, stained by the Weigert method and by hematoxylin and acid fuchsin, showed no pathologic change. In the pons, the fibers of the pyramidal tract were less distinct than in the lemniscus, which, however, may not be of much importance. The posterior columns were intensely degenerated throughout the length of the cord. In the thoracic and lumbar regions the degeneration was almost complete. At the sixth cervical segment the degeneration was still intense, but the number of healthy fibers was greater than in the thoracic regions. The posterior roots were intensely degenerated at all levels, while the anterior roots were intact. In the lumbar region the cells in the anterior horns showed distinct change, and this was also true—though to a less degree—in the cervical region. The nucleus of the nerve cell was much swollen, and the cells had lost their dendrites. The columns of Clark were well preserved. In one spinal ganglion there was some round-celled infiltration, but apparently no change in the cell. The other tracts of the spinal cord appeared to be intact.

I was unable to find any of the changes described by Dana in his case of paralysis agitans reported in 1899, except in the cells of the anterior horns in which the dendrites had disappeared, and the nuclei were swollen and displaced. In Dana's case there was fatty degeneration of the muscle, but I was unable to find this in my case.

The pathologic findings in this case are what one would expect to find in a fairly well-advanced case of tabes, and I do not feel justified in claiming that any part of the lesion present accounted for the presence of the tremor. I can not even say that the arterial change was sufficiently advanced to warrant any comparison with those cases of paralysis agitans in which it has been claimed that lesions resembling those of old age were found. But the pathology of paralysis agitans is still a matter of much doubt.

I was unable to find in my case lesions resembling those described by Schifferdecker, who found degeneration of the muscle spindles. The case that I have just described is possibly one of tabes associated with paralysis agitans.

1732 Pine Street.

Ten Thousand Photographs a Second.—Photographs taken in one-ten-thousandth part of a second are an achievement of the Institute for Technico-scientific Investigations in Neubablesberg, near Berlin. The destruction of bone by a modern small-bore bullet is shown by a series of photographs taken during the progress of the bullet.

HAVE DRUG ADDICTIONS A PATHOLOGIC BASIS?*

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In studying the pathology of drug addiction, it seems to me we have a threefold problem to solve. First, there is the hereditary abnormal aspect—the psycho-cellular pathology; second, the acquired abnormal conditions of the individual, which lead to the use of drug stimulants—the pseudo-pathology; and, third, the effect on the system of the particular drug used—the true pathology of the addiction.

PSYCHO-CELLULAR PATHOLOGY.

I am perfectly well aware that good authorities deny the influence of heredity among drug habitués, but I do not believe that this ground can well be maintained. First of all, it is a matter of record in the study of the histories of a large percentage of habitués of all kinds, that we find taints of varying degree among the ancestors of these individuals. It is a matter of very common occurrence to learn that either one or both parents, or some immediate ancestor, had been the victim of chronic nervous or mental affections, or had been addicted to the habitual use of alcohol, morphin or some other narcotic. When we consider the especial meaning of heredity, it should become apparent that the influence on the individuality and innate characteristics of the nerve cells of the offspring should be distinct.

In all probability, in the light of modern scientific research, we must admit that there is no such thing as hereditary disease, but it is equally certain that the conditions, characteristics and environments of the parent cell may be conveyed to the fetal cell to a disproportionate degree. True heredity must reach back to the very initial fertilization of the male and female cell. It must exist in the primary conception of fertilization. The particular development of this individual fertilizing cell undoubtedly modifies either in the one or the other direction, the manifestations which may be, at the beginning, inherent in this cell. After fetal life, conditions of environment and education, and the development of associations, further serve to modify for good or for evil the inherent characteristics of the primal cell. On this basis of reasoning, it seems to me that it would be impossible to conceive of malignant disease as existent in the primal fertilization, else would the ovum never develop into maturity. This would not necessarily obtain where we were dealing merely with tendencies of the parent cell, which might later develop through circumstance or environment into a nervous diathesis, resulting finally in a state of atavism. It is a well-known fact that the progeny of chronic invalids, of epileptics or of alcoholists, and mental and moral wrecks, develop the tendencies of ancestry to an augmented degree. The annals of criminology, as well as of the great charitable institutions of the world, reveal this to a remarkable degree. It is my belief that the same thing can be demonstrated in the peculiarities of the offspring of those addicted to the inordinate use of the various drugs.

We will all of us grant without question, I believe, the effects on the mental and moral sphere of the progeny of drug habitués; yet the mental and moral deter-

* Read in the Section on Nervous and Mental Diseases of the American Medical Association, at the Fifty-fifth Annual Session, June, 1904.

mination of these cells must be dependent on the healthy organic conditions of these cells, on their ability to exhibit the normal characteristics of brain cells, especially as regards their motility—that is, their power to alternately become active and to fall into repose.

In the histories of those drug habitués who take up the, so to speak, inherent tendency to the use of the drug, it is remarkable to find the constantly recurring fact that either one or both parents or immediate relatives were also drug users.

PSEUDOPATHOLOGY.

The occasional causes for the acquirement of drug habits are too numerous to classify, but, taken as a whole, they may be subdivided into, first, the use of drugs purely as a stimulant; and, second, their use to efface some physical or mental distress, whether this be in the nature of pain, worry, grief or shock. Ultimately, the main factor in the causation of all drug habits, whether they be based on hereditary influences, on physical or mental weakness, or on physical or mental pain, is always the same, namely, the weakness of the nerve cell and the lack of vital force, which make the individual powerless to combat the strenuousness of existence. In the one or the other direction, the victim seeks to fortify his failing mental or physical power through the aid of a stimulant.

Unless the individual be burdened by extremely strong hereditary taints, or be the subject of innate, vicious moral principles and of the lowest and lower grades of intellectuality, there is usually some element of physical weakness in play, which he endeavors to overcome by artificial means. A study of the individual histories of such persons will almost invariably show that there has been some definite cause which has brought about a physical incapacity to deal with the problems confronting him. It is not at all unusual to find that a previous illness has resulted in bodily prostration, not infrequently associated with a greater or less degree of insomnia, to overcome which the patient has had recourse to alcohol in some form to sustain the physical vigor, and to opium in some form to bring on sleep. It is almost as frequently true that mental or psychic pain has been the source of the drug addiction.

In this connection, it is but just to say that members of our own profession have often been derelict in their attitude toward their patients, in that they themselves have thoughtlessly prescribed stimulants of the alcoholic variety and used narcotics of the morphin variety in a careless manner, and in individuals whose resisting power was so low that they readily became the victims of a habit which had been found to bring such material relief. I take this occasion to condemn the practice, wherever it may exist, of using opium to induce sleep. Opium and its derivatives should be used only for the definite purpose of relieving intense pain, and then only as a last resort and under circumstances which warrant the physician in the belief that his patient will not become addicted to its use.

To the ever-increasing army of alcoholics and drug users, men and women of the higher social strata are bringing a vast contingent, certainly as large, if not even greater, than the total number of recruits from the lower classes. The reason for this is not hard to find, when we consider for a moment the vast amount of intellectual and vital force necessary to keep up with the advance and demands of civilization. While it is equally true of lawyers, clergymen, and social idlers, perhaps the best example and the one which appeals most to us, is that of the physician who himself becomes a drug habitué. Unfortunately, a greater and greater number among our profession are seeking assistance and solace in that direction. We are especially unfortunate in that our knowledge of medicine and of the various drugs, and the readiness with which we find them constantly at hand, make the physician the easiest victim of all.

The physician, with a large amount of work and worry, with the ceaseless mental strain, often associated with physical hardships and loss of sleep through the demands of his professional duty, who misses this week one night of sleep and the next week two or three, feels that he needs something to stimulate and keep him in professional harness. He says to himself that he knows all about the drug he is using, that he knows its influence, that he knows its effects and its side effects, that he can stop when the latter show themselves; but it is for all the world like getting on a toboggan slide and determining to step off when you are half way or three-fourths down the course. It is a very easy thing to determine to do, but an extremely hard one to accomplish. It has always seemed strange to me that physicians who need such stimulants do not seek the safe refuge of strychnia, instead of the dangerous solace of opium and alcohol.

TRUE PATHOLOGY.

In considering the third problem before us, namely, the effects on the tissues of the system as a whole, and on various organs, notably the central nervous system in particular, we have a peculiar difficulty to overcome.

It must be remembered that most users of drugs have been addicted to the habit for longer or shorter periods of time, during which processes other than those induced by the drug used may have concurrently been in play. To arrive at the true pathology of any addiction, therefore, it would be necessary to exclude all factors other than that of the drug employed. Unfortunately for the solution of this particular problem, few persons, relatively speaking, die from the effects of drugs used in habitual wise. Intercurrent diseases usually bring on death. In acute poisoning, as in cases of suicide, the effect is so rapid on the vital centers that cellular changes have had no opportunity to occur, and in those cases rescued by immediate efforts, presumably few, if any, develop; at least, we are unable to study them.

We must, therefore, confine our inquiry into such pathologic conditions as may be found in individuals who have been habitués for periods of time, and here again we are confronted with a universal difficulty, for the ultimate effects on chronic users of the common drugs, like alcohol and opium, is that the entire system becomes highly acid. This really in itself constitutes a true pathology, and, in my opinion, it is the true pathologic basis. Just in this feature, however, we encounter another problem. We know that acidity of the organism, if that state exist through a space of time, in itself induces cellular changes within the various organs. So far as the minute and even the gross alterations of tissues are concerned, these are very similar in all conditions of an acid character, no matter what particular factor may have produced the hyperacidity. This is as true of the use of opium as of alcohol, the effects of which have been well studied and are clearly understood.

It has been claimed that the pathology of chronic morphinism differs materially from that of chronic alcoholism. On this ground it has been claimed that the effect on the offspring of morphin habitués is in no

wise similar to that of the effect on the offspring of chronic alcoholics. To this doctrine I am absolutely opposed. If it be granted, as it undoubtedly will be, that addiction to any drug through a long period of time brings with it a deterioration of cellular activity in the higher nerve centers of the user, then we must also admit that the character of the fetal cell would be determined in analogous wise to that exhibited by the cellular deterioration in other affections. This is especially manifest when we consider the development of the ovum in utero of a mother whose system is impregnated by the physiologic effect of opium. Examples of this malignant and characteristic effect have repeatedly been found in newborn infants of mothers who, during the period of gestation, had been using morphin, either alone or in combination with other drugs, constantly. Such infants, immediately after birth, differ from ordinarily healthy children in that they are very apt to be inordinately drowsy, refuse to nurse, and have been known to sleep steadily for twenty-four hours. After the period of somnolence, the stupor disappears and these infants show excessive irritability, have colic pains, and are liable to become very cyanotic. These are the so-called "blue" children (Happel). The cyanosis is probably due to a lack of closure of the ductus arteriosus and foramen ovale in the heart. The administration of opium in those instances where the development of the child has not been irreparably arrested, promptly relieves not only the irritability and the colic-like pains, but also the cyanosis, and, moreover, the opium must be administered constantly and the child must be weaned away from it, in the same way as in adult narcotism.

It must be understood that the foramen ovale is never closed until after the birth of the child, that it is the very last remnant of fetal existence which remains to be completed. If so malignant an organic defect can result from habitual use of morphin, then I cannot conceive of any valid ground on which to dispute the effect on nerve cells in the brain, notably in the presence of the evidence which is manifest in the relief of the symptoms through the administration of opium in any of its forms.

In many instances, we are dealing with the finest, most minute details of the anatomic and physiologic structures of the body. The effects of alcoholism in this respect are well understood. We know that alcohol, used in constant and varying quantities, exercises an extremely deleterious influence on the vascular system throughout its entirety. Secondarily, we know that it extends its pathological effect to the various cellular tissues of the body, notably that of the nervous system. I am referring here especially to the individual who is denominated a "steady drinker," the man who always drinks and who prides himself on the fact that he never becomes intoxicated. It is just this man in whom the effects of the stimulant are most manifest. The occasional or periodic drinker—unless these occasions become so frequent as practically to form a continuity—comes to little or no grief, but the steady drinker is the one in whom the delicate regulatory mechanism of the vascular system becomes early impaired. From this point onward, the pathologic process is constant and destructive, and ends in the hardening of the blood vessels, which predisposes to tissue inanition and faulty metabolism. In consequence, we note the general disturbance of the emunctories, with disease of the kidneys, liver and the other organs of the body. In the nervous system, the effect is especially bad. Here we note not only vascular changes with degeneration of the blood vessel walls, but we have characteristic cellular changes in the brain; disarrangement of the chromophyl-granules, with distortion and dislocation of the nuclei and nucleoli, and vacuolization of the cells.

If the process does not go too far, we find in such cases manifestations of the disturbance of the function of the nerve cell, with a loss of power for activity and repose, which is indicated by a general neurasthenia and cerebrasthenia. If, however, the process passes beyond this point, which I should designate that of "recoverability," then we have exhibited the paralysis of power of the cells in whatever field of function they may represent.

What has been said of the pathologic effect of alcohol is, I believe, equally true, though probably in far less degree, of other drugs used to excess. While many good authorities contend that this is not the case and that morphinism and its sister vices are purely diseases of the moral and mental sphere, it seems to me that they forget the essential power of motility in the brain cells. It seems to me that it makes no difference whether we are dealing with a brain cell of motor function, or moral function, or intellectual function, the same principles must hold good in any or all of these cases. I am an adherent of the doctrine of the motility of the nerve cell, which in its normal condition has the power to change somewhat its form by withdrawing its dendritic processes from contact with other processes, but in nowise has the power of changing its concrete location. If, therefore, for any cause this loss of motility in the nerve cell, which is a structural thing, becomes impaired beyond the power of recovery, then we have a pathologic basis of a structural nature in the cell itself. I believe, therefore, that not only chronic alcoholism, but also chronic drug addictions of every kind have a physical basis. We must not lose sight of the fact that structural changes of the cell, heretofore beyond our limits of vision, are now known to be possible of study by means of intense lateral illumination, which has increased the power of our microscopes many hundred-fold.

In the near future we may justly hope to acquire definite knowledge of pathologic cellular and other changes, of which at the present time we have no adequate conception.

Just as the fundamental factor for the necessity of all stimulation by drugs lies in the innate loss of force within the nerve cells, so the universal ultimate pathologic effect of almost all drugs used to excess is to render the entire organism highly acid. Certainly this is true of alcohol and of opium, the most common addictions. Whether or not many of the pathologic tissue changes do not depend directly on the hyperacidity of the system remains as yet a matter of doubt and study.

While this is undoubtedly true, it seems to me that we may even now assume that drug addictions have a pathologic basis, expressed as follows:

1. By the hyperacidity of the system.

2. By minute structural changes within the cerebral cells in particular, and probably also alterations in the vascular tissue.

In addition, we must admit that hereditary influences and the presence of faulty conditions—physical, mental and moral—play a most important rôle in the development of narcotic habits, but that, while they may have a pathology all their own, this must in nowise be considered an intrinsic feature of the true pathology of drug addiction itself.

DISCUSSION.

DR. A. J. PRESSEY, Cleveland, stated that probably what is really inherited from parents addicted to alcohol or morphin is a feeble constitution, a neurasthenic condition, and a lowered vitality. But it is perhaps doubtful if such a person is much more liable to acquire a habit than a child born of parents who have given to their offspring the same condition from some other cause. Persons only get alcoholism from alcoholics and morphinism from morphin. During the past ten years Dr. Sterne has treated from 50 to 75 morphin patients each year. A very large per cent. of these patients have been persons who were born of parents of average health and who were free from either alcohol or morphin addiction. A large per cent. of these patients acquired the habit from taking morphin for the relief of severe and long-continued pain. One-half of his patients year after year are physicians; this is not a reflection on the profession. He is sure, judging by observation and by patients' statements, that more than three-fourths of these physicians acquired the habit from severe pain long continued; they were not born degenerates. A man is not necessarily a degenerate because he takes morphin. Dr. Sterne claimed five years ago that an acid condition of the patient is the cause which produces the extreme nervousness during the withdrawal of the morphin. Dr. Pressey has since that time given various forms of the alkalies, but with the one exception of phosphate of soda, has received no benefit, and asked Dr. Sterne if he still believes there is a hyperacidity and from what form of alkali he receives the most benefit.

DR. RICHARD DEWEY, Wauwatosa, Wis., referred to the chemical union of the alcohol or the morphin and other narcotic products with the nerve cells. He stated that about two years ago he read an article by a Russian, who published the results of some researches in which he claimed to demonstrate the chemical union of the morphin with the nerve cells, and it has always seemed to him that researches in that direction would be of value.

DR. S. M. CROWELL, Charlotte, N. C., declared that he has come to the conclusion that we, as American physicians, know but very little about the pathology of either alcohol or drug addictions because so few physicians have studied these conditions scientifically or made clinical researches. They have been too prone to look on them as malicious habits which could be abandoned at will, and most physicians try to get rid of such cases as quickly as possible, as they are so difficult to treat in general practice. As a consequence of this attitude of the profession little positively is known of the pathology of this condition. Dr. Crowell does not believe that the pathology is the same in alcoholism, opiumism and cocainism. He thinks that the pathology in these cases is due, not so much to a hyperacidity of the system as to a toxemia of some kind. He does not believe in the alkaline treatment of opiumism as advocated by an English author, though occasionally some alkaline preparation may be given as indicated. He considers that the rational method is to eliminate whatever this effete material may be from the system by the various emunctories and not to rely on the alkaline treatment.

DR. SMITH ELY JELLIFFE, New York, said that one of the greatest troubles in the way of pathology is the lack of facts concerning the actual conditions. Physicians suspect a great deal, and talk very glibly of acid conditions, alkaline states, suboxidations, lack of elimination, insufficient water in the system, etc., but there are practically no recorded data available beyond a few really good studies by Faust and his colleagues. He made a motion that the section have a committee appointed to investigate one of these subjects and apportion among the members work in some particular line. He suggested that some one investigate the nerve cell changes in acute morphin poisoning, as has been partly investigated by Ewing; another, the state of the leucocytes or distribution of the blood elements. Another fruitful line of inquiry opened up by Faust concerns the development of antitoxins for morphin. These are some of the problems, none of which has ever been thoroughly worked out. By this means something definite may be obtained in the line of rational pathology of drug habits.

DR. ALBERT E. STERNE, Indianapolis, stated that the paper was an inquiry into the pathology of drug addictions and that naturally some etiologic factors were included. He believes that when more is known of the true pathology of drug addictions the condition suggested by Dr. Dewey of the chemical union of drugs with nerve cells may be found. In cases in which the fetus is affected by the use of drugs by the mother it must be by means of some kind of chemical action, but whether it is a chemical union with the nerve cells or a chemical union with the fluid tissues of the blood is not known. The only agency that carries chemical power in the body is in the blood corpuscles themselves. Dr. Sterne can not see wherein the system can escape acidity, though a great degree of hyperacidity must not be expected in these conditions. The system never becomes so intensely acid that the secretions of the body will have a decidedly acid reaction unless it be secretions from the stomach. The secretions which are normally alkaline have lost their alkalinity and, therefore, there must be a hyperacidity. In Dr. Sterne's opinion it is revelations of this character which account for the so-called characteristic abstinence symptoms of these cases. If the stomach is washed out repeatedly these abstinence symptoms are frequently absent. It is his practice to use a large amount of some saline solution or bicarbonate of soda. This promotes elimination and it brings fluid into the body and into the tissue which are practically water hungry and promotes metabolism. Dr. Sterne admits that he believes these symptoms have a physical basis, but he is uncertain just what that basis is. Everything external to the effect which the drug itself exercises on the system must be eliminated.

The chairman announced later in the day that he had appointed the following committee: Dr. Smith Ely Jelliffe, New York; Dr. Brooks F. Beebe, Cincinnati, and Dr. Albert E. Sterne, Indianapolis.

FAT EMBOLISM OF THE LUNG, FOLLOWING FRACTURES.

WITH REPORT OF TWO CASES.*

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The study of fat embolism has been comparatively neglected by Americans. It has never been the subject of a paper read before the American Medical Association, and in the perhaps 250 cases that have been reported in the literature not over a dozen have been contributed by writers of this country.

These facts, with an experience of two cases in as many years, led to a study of the subject and to the belief that it is deserving of more consideration than is usually given it, and to a presentation of the subject, at this time, in the hope of stimulating an interest that might result in more definite knowledge.

HISTORY.

Magendie,[1] in 1827, was the first to demonstrate, experimentally, that the injection of oil into a vein might produce dyspnea and even death. In 1839 R. W. Smith[2] noted two cases of fatty heart with free oil in the blood. MacGibbon,[3] in 1856, reported an instance in which delirium tremens was complicated by sudden dyspnea,

* Read in the Section on Surgery and Anatomy of the American Medical Association, at the Fifty-fifth Annual Session, June, 1904.

1. Magendie: Vgl. dessen Lecons sur les Phenomenes Physiques de la vie, vol. i, p. 139, 1827.
2. Smith: Dublin Jour. Med. Sci., n. s., vol. ix, 1854.
3. MacGibbon: Amer. Jour. Med. Sci., January, 1856.

pallor and coma, which terminated in death. At autopsy all of the organs, especially the heart, were fatty, and free fat was found in the blood.

The first instance in which this fat was found to interfere with the circulation, by embolism, was in the case observed by Müller,[4] in 1860. At the autopsy the vessels of the choroid were found plugged with fat, which was supposed to have arisen from an atheromatous plaque of the aorta. That some of the pulmonary vessels might be obstructed by fat following fracture was first noted by Zenker[5] in 1862, and at about the same time E. Wagner[6] made similar observations, but supposed that this fat was the result of pyogenic processes. Bergmann,[7] in 1863, injected oil into the circulation of animals and clearly established a distinction between fat embolism and pyemic processes.

In 1864 Flournoy[8] met with the first case in which the condition was recognized as the immediate cause of death, and at the autopsy by Von Recklinghausen established fat embolism as a possible cause of death after fracture. Wagner[9] made a second study of the subject, and in 1865 published 48 cases in which he had found embolism of this character, in 15 of which death rapidly followed severe injury to the bones. In the following year Busch[10] collected 43 cases, and with a study of these presented a series of experiments in which cinnabar was injected into the marrow of the bone, and after fracture this substance was found in the peripheral capillaries.

These different and fundamental studies cleared up the subject considerably, but perhaps the most notable contributions were to follow. Czerny,[11] in 1875, reported a case that has become classic, and made a most extensive study of the subject.

The first report of a case in America was during the following year by Fitz[12] of Boston In 1877 Hahn[13] made extensive experiments on the lower animals and found that fat embolism existed in all cases in which the marrow of the bone had been interfered with. Reidel[14] presented an analysis of 12 cases met at autopsy, while Boettcher[15] reported an instance in which it followed gunshot of the knee, and Hamilton[16] one as a result of rupture of the liver. Bailey,[17] in America, observed a case following contusion with punctured wound of the leg.

In 1879 many important articles on the subject appeared. In France Dejerine[18] demonstrated the effect of pressure as a causative factor, by the introduction of a laminaria tent into the medulla of the long bones in dogs, and found that embolism occurred much more frequently when this was done. He also reports 12 cases that he noticed in his own practice. Duret[19] at about the same time reported a fatal case and called attention to the condition.

In Germany, Sinclair[20] collected 140 cases and gave a very comprehensive analysis of them. Flournoy[8] published his work on the subject. Jolly[21] described 3 cases in which fat embolism was found after simple rupture of the fat cells of the subcutaneous tissue.

Weiner,[22] from Cohnheim's laboratory, proved that the oil might be absorbed by the lymphatics of the connective tissues or even from the serous cavities. Scriba,[23] who, perhaps, has made the most thorough study of the subject, likewise published his work in this same year. After many experiments, and a review of 177 cases from the literature and records, his most striking conclusion is that death in these cases is not due to interference with the heart or lung, but to the presence of large numbers of emboli in the brain or spinal cord. In America, at the conclusion of that remarkably prolific year, the late Christian Fenger[24] reported a case that he diagnosed during life and which was corroborated at the autopsy, this being in all probability the third case reported in this country and the first to be recognized during the life of the patient.

In England, in 1880, F. A. Southam[25] was the first to report a case and to call attention to the subject. In the following year Mr. C. W. M. Moullin[26] made an extensive study of this condition from postmortem material. Saundby and Barling[27] also reviewed the literature, reported a case and found fat embolism in a large proportion of autopsies following traumatism, and Skirving[28] in 1882 reports three cases.

In 1884 Roswell Park[29] was the fourth American to call attention to the subject, and in a report of one case, and two other possible but unverified instances of this kind, he discusses the question *pro* and *con* and urges on the profession an appreciation of its importance.

Since the early 80's, while a large number of cases have been noted abroad, there has been but little practical advance made. The important work of Colley,[30] in 1893, followed by that of Eberth[31] and Payr,[32] in showing the relationship between orthopedic operations and fat embolism, is an exception, and a marked addition to our knowledge of the subject.

ANATOMY.

A brief review or consideration of the anatomic parts involved in fat embolism will be an aid toward a better understanding and a more comprehensive discussion of the subject.

At the site of the fracture there is a break in the continuity of the bone, with more or less comminution and injury to the adjoining soft parts. The bone, especially the compact tissue, is very profusely supplied with blood vessels. The veins are more numerous than the arteries, have thin walls and are often supported by a bony canal. These veins when divided have little tendency to close, and the bony surroundings protect them from lateral pressure.

The medullary canal is likewise very freely supplied by one or more nutrient arteries, each artery being frequently accompanied by two veins.

4. Mueller: Wurzburg Med. Zeit., 1860.
5. Zenker: Beit. z. Norm. and Path. Anat. d. Lunge. 1862.
6. Wagner: Arch. d. Heilkunde, vol. iii, No. 3, 1862.
7. Bergmann: Zur Lehre von der Fettembolie Dorpat. 1863.
8. Flournoy: Cont. a latude de lembolie graisseuse, Strasburgh, 1879.
9. Wagner: Arch. d. Heilkunde, vol. vi, p. 146.
10. Busch: Virchow's Archiv, 1866.
11. Czerny: Berl. klin. Woch., Nos. 44-45, 1875.
12. Fitz: Boston Med. and Surg. Jour., 1876, vol. xciv, p. 192.
13. Hahn: Wein. med. Woch., No. 37, 1877.
14. Reidel: Deut. Zeit. f. Chir., vol. viii, 1877.
15. Boettcher: Jour. Anat. and Phys., vol. xvi, Saundby and Barling.
16. Hamilton: Boston Med. Jour., Oct. 6, 1877.
17. Bailey: Trans. Med. Soc., New York, 1877, p. 293.
18. Dejerine: Progress Med., March 1, 1879.
19. Duret: Progress Med., March 8, 1879.
20. Sinclair: Corresp. Bl. f. Schweizerische Aerzte, No. 6, 1879.
21. Jolly: Jour. of Mental Science, 1881-82, vol. xxvii, translated by T. W. MacDowell.
22. Weiner: Archiv. f. Exp. Path., vol. xi.
23. Scriba: Deut. Zeit. f. Chir., 1879-80, vol. xii.
24. Fenger: Med. Rec., Jan. 3, 1880, p. 127.
25. Southam: Lancet, July 10, 1880.
26. Moullin: Lancet, 1881, vol. ii, p. 364.
27. Saundby and Barling: Jour. Anat and Phys., 1881-82, vol. xvi.
28. Skirving: Lancet, Oct. 7, 1882, p. 567.
29. Park: N. Y. Med. Jour., Aug. 16, 1884.
30. Colley: Deut. Zeit. f. Chir., 1893, vol. xxxvi, p. 323.
31. Eberth: Fortsch. der Med., 1898, vol. xvi, p. 251.
32. Payr: Zeit. f. Orth. Chir., 1899-90, vol. vii, p. 338.

The marrow is of different varieties, but usually, in the adult long bone, there is to be found the so-called yellow marrow, which is 96 per cent. fat, supported by connective tissue trabeculæ in which there is a large number of blood vessels. This fat exists in cells—that is, a mass of fat within a distinct cell membrane, and before the fat can enter the circulation this cell membrane must be broken and the liquid fat set free.

This rupture of the cell membrane is accomplished by the force of the traumatism. After fracture the broken ends or spiculæ of variable size may be forced into the marrow, so that at the same time that the vessels are torn the fat is liberated.

This fluid fat is taken up by the veins and carried to the right heart by the vena cava and thence to the lung by the pulmonary artery.

The entrance of the fat into the circulation must take place comparatively soon after the injury, for the openings in the vessels are soon plugged by thrombi which to a large extent prevent the further admission of fat.

Lateral or incomplete tears of the vessel walls will, of course, become occluded more slowly than will complete ruptures, and in a large number of fractures such a condition is frequently found. It has been claimed that the fat may enter the blood stream directly through the venous wall, but this point has not yet been perfectly worked out.

Another and uncommon route by which the fat may gain entrance to the circulation is by way of the lymphatics. That this substance might be taken up by injured lymphatic vessels has long been known, but it has been demonstrated that absorption may take place from the serous sacs or even from the connective tissue spaces.

The transit through the lymphatic glands is slow and is thought by some to exert an emulsifying action which makes the fat inert and unable to form an embolus. This has been contradicted by Weiner[22] in his very convincing experiments.

TRANSIT THROUGH THE LUNGS.

The foreign body, the fat, enters the lung with the blood from the right heart by means of the pulmonary artery and proceeds with the blood through the branches, which gradually decrease in size and multiply in number till the network of capillaries surrounding the air sacs is reached.

It has been claimed that the forceful impact of the globules of oil against the walls of the vessels, especially at the numerous divisions, results in a breaking up of the drop into many smaller ones which are able to pass through the finer ramifications of the pulmonary artery.

It is here, in the capillary network of the alveolar wall, that the progress of the embolus is first interfered with. Owing to the diminished caliber of the vessel, the fat meets with difficulty in effecting a passage, and as a result there is interference with the circulation of the blood in this particular region, hyperemia behind and anemia in front of the obstruction, with sometimes the formation of typical hemorrhagic infarcts, a condition of edema, and with it all an imperfect and unsatisfactory aeration of the blood.

The importance of this pulmonary obstruction has been variously estimated. Scriba[23] has shown that sufficient fat to seriously obstruct the circulation of the lung, experimentally, at least, is practically an impossible result of any accident that may give rise to fat embolism. He considers the cause of the disturbance in the lung to be due to interference with the respiratory centers of the central nervous system.

Practically always some part of this fat does pass through the capillaries of the lung, either at first without difficulty, or later, after the heart's action has been augmented and made itself felt. These droplets of oil easily gain entrance to the systemic circulation by way of the pulmonary vein, the left heart and the aorta.

FAT IN THE SYSTEMIC CIRCULATION.

The particles of fat pass along with the blood stream, giving rise to no symptoms till they once more meet with resistance to their farther passage in the capillaries. But even with such obstruction of the ordinary capillary there will be little disturbance or appreciable symptoms because of the profuse collateral circulation. It is only after the obliteration of the lumen, together with a shutting off of a terminal artery, that serious manifestations are noted. These arteries, called "terminal" by Cohnheim, do not have a collateral circulation, the branches of such an artery communicate only with the branches of a corresponding vein.

Typical arteries of this character are to be found in the kidney and the spleen; atypical ones—that is, arteries in which there is a very small collateral circulation—are found in the brain, spinal cord, lung, stomach and intestine.

When embolism, by fat or any other substance, of these arteries occurs there follows infarction and a disturbance of function of that part of the organ which is deprived of its circulation. The importance of this loss of function depends on the organ involved; for instance, all things being equal, a larger area of the lung or kidney could be interfered with than could the same area of the brain or medulla.

The lung, the brain and the kidney are most often found to be the seat of fat embolism. The frequency with which the brain is involved possibly may be explained by the close relationship to the heart or the more direct flow of the blood from the aorta into the carotids.

ETIOLOGY.

Fracture is not the only cause of fat embolism, although in practically all fractures there is fat embolism to a greater or less extent. In 43 cases collected by Busch,[10] 24 were due to fracture; in 140 reviewed by Sinclair,[20] 84 followed fracture; Scriba[23] found 177 cases, 93 of which occurred after fracture; of 12 cases reported by Moullin,[26] fracture was the cause in 7; in 10 cases of death following injury, examined by Saundby and Barling,[27] fat embolism was found 8 times, in each instance following severe injury to bone; and in 17 cases of fracture Carrara[33] found fat embolism in 76 per cent. The fracture may be either simple or compound; other conditions being equal, it is thought to occur more frequently after a simple than after a compound fracture because of a lack of drainage, and, therefore, an increase in the tension at the site of the injury.

With comminution, the symptoms of fat embolism occur more frequently than after those in which there is no comminution, because of the greater damage to the marrow of the bone and to the opening of additional vessels.

Rough handling of the fractured limb, as in transportation, because of the additional injury to the fat cells in the marrow, is prone to favor the occurrence of fat embolism.

33. Carrara: Freidreich's Blatter, July, 1898.

Extension into a joint is also conducive to the occurrence of these symptoms, as the fat may be absorbed by the serous surfaces.

Fat embolism follows fracture of the extremities more often than of the bones of other parts of the body, but it may follow the fracture of any bone, as in the case cited by Moullin, in which the lung was found filled with fat in a case that died almost instantly after fracture of the cervical vertebra. The long bones are filled with yellow marrow which is almost entirely fat, while most of the other bones, such as the vertebra, sternum, ribs, etc., have comparatively little fat in the composition of their marrow. It has been found as a complication of fracture of the lower extremity more often than of like injury to the upper extremity, and more frequently after a break of the femur than of the bones of the leg.

It is a complication that occurs in the strong, robust, middle-aged patients, and in males more frequently than in females, for the very obvious reason that the former are more exposed to severe physical injury. In the weak, emaciated or exhausted it is less likely to occur, as the fat in the marrow of such individuals is not excessive.

Minich[34] has pointed out that the fat in the marrow of children is very small in amount, and that fat embolism is rarely seen in children A similar condition and a similar immunity, though not quite so certain, is found in the aged..

Ribbert,[35] in a recent communication, claims and experimentally proves that this phenomena is caused by any jar or severe concussion of the skeleton, and that fractures or the forcible reduction of an ankylosis in respect to fat embolism is merely an indication that the bones of the body have received a severe jar.

Hahn,[13] very early in the history of the subject, made experiments in which he caused fat embolism by fractures of varying extent and severity, but after the simple removal of a V-shaped piece of the shaft of the femur, without opening into the fat-containing medullary canal, he was unable to detect any evidence of fat embolism.

OTHER CONDITIONS CAUSING FAT EMBOLISM.

Among the conditions other than fracture that may be followed by symptoms of fat embolism are the following: 1, Orthopedic operations; 2, open operations on bones or joints; 3, surgical operations on structures other than bone; 4, inflammation of bone or periosteum; 5, laceration, bruising or suppuration of the fat-containing soft parts, extensive burns or scaldings; 6, rupture of fatty liver; 7, causes arising within the circulation, as: (*a*) Atheromatous changes of the vascular wall; (*b*) fatty changes of thrombi, of various origin and location; (*c*) diabetes, icterus.

Orthopedic Operations. Cases in Which the Bone is Not Fractured.—Colley,[30] in 1893, was one of the first to attract attention to this phase of the subject. In 1900 Payr[32] was able to collect 9 fatal cases, and since that time additional instances have been reported.

Open Operations on Bones or Joints.—Paul Vogt[36] was, perhaps, the first to report the occurrence of fat embolism after resection of the knee joint; since then, however, it has been noted by many as a sequel to resections and operations on bone.

Surgical Operations on Structures Other Than Bone.—Roswell Park.[29] in 1884, mentioned a case of sudden inexplicable death, after amputation of the breast in a very fleshy woman, and believes that this death was due to fat embolism. It has also been suggested that some of the so-called postoperative pneumonias may be explained by the supposition that the disturbance in the lung was caused by fatty emboli.

Inflammation of Bone or Periosteum.—In the early investigations, such as those of Wagner,[6] Busch[10] and Flournoy,[8] fat embolism was found in varying proportions in connection with diseases of the bone and periosteum. Niederstadt,[37] in 1869, was the first to consider this relationship in length.

Laceration, Bruising or Suppuration.—Bailey,[17] in 1877, and Fitz,[38] in 1878, called attention to the possibility of fat embolism occurring without injury to the bone. Flournoy,[8] in the following year, mentioned an obscure case of this character, and in 1879, Jolly[21] considers the question at length, and especially in relation to the acutely insane. It may be mentioned, in this connection, that Hahn,[13] in his experiments, could not produce fat embolism by breaking up the subcutaneous fat, or that of the mesentery. In 13 cases of death due to burns and scalds, Carrara[33] found fat embolism in 44 per cent.

Rupture of Fatty Liver.—This as a cause of fatty embolism was noted by Hamilton[16] in 1877; a somewhat similar case was reported by Engel[39] in 1901.

Causes Arising Within the Circulation.—Another class of conditions may give rise to fat embolism, but they differ from those above, in that their origin is within the lumen of the blood vessels.

Atheromatous Changes of the Vascular Wall.—This condition was the cause given to explain the presence of fat in the capillaries in perhaps the first clinical observation of this condition, Müller,[4] 1860.

Fatty changes of thrombi: The fatty degeneration of thrombi is apparently a condition that does not often give rise to serious symptoms of fat embolism.

The thrombi may lie in various situations, and may be due to various causes, such as thrombosis at the site of fracture or other injury after operation or pathologic changes or in the uterus after delivery.

Virchow[40] has called attention to the relationship between fat embolism and puerperal eclampsia. All of these may undergo fatty change and give rise to the presence of fat in the blood, but it is usually in such small quantity that it rarely gives rise to noticeable symptoms.

Diabetes, grave icterus and other conditions: These sometimes are accompanied by lipemia, but the occurrence of embolism is comparatively rare.

It has been suggested that the terminal coma of diabetes is due to fat embolism of the brain. The first case of this character was reported by Saunders and Hamilton[41] in 1879, and in 1881 Saundby and Barling[27] consider the subject, and conclude that the finding of fat embolism of the brain in these cases is not constant, and that the question is still an unsettled one.

E. Payr[42] has called especial attention to the presence of the status lymphaticus in his fatal cases following orthopedic manipulations. He points out that with such a condition there is greater danger of the occurrence of embolism, and when once instituted the prognosis is much more grave. The same is undoubt-

34. Minich: La Sperimentale, March and April, 1882, vol. xlix, pp. 253, 270, 337, 359.
35. Ribbert: Deut. med. Woch., June 28, 1900.
36. Vogt: Cent. f. Chir., 1883, No. 10, p. 67.
37. Neiderstadt: Dissert. Gottingen, 1869.
38. Fitz: Boston Med. and Surg. Jour., 1878.
39. Engel: Muen. med. Woch., 1901, No. 26.
40. Virchow: Deut. med. Woch., July 15, 1886, p. 448.
41. Saunders and Hamilton: Edin. Med. Jour., 1879, p. 47.
42. Payr: Muen. med. Woch., July 12, 1898.

edly true in any weakening condition of the individual. The increased danger of anesthetics in these cases of status lymphaticus has been recognized for a long time, and the subject is still rather obscure, as can be seen from the recent contribution to the subject by Gwyer.[43]

SYMPTOMATOLOGY.

The symptoms of fat embolism vary greatly, as will be readily understood when it is remembered that embolism of this character, to a greater or less degree, follows practically all fractures of the long bone. In the vast majority of such instances no symptoms, worthy of the name, are noticeable. Fat embolism may also cause death practically instantaneously in a manner closely simulating that caused by the introduction of air into the circulation. There may be present many modifying circumstances or complicating conditions which make the symptomatology rather vague and indefinite.

The milder form is rarely diagnosed, and is of little importance. The moderate degree of restlessness, anxiety and slight dyspnea which frequently follows fractures, has been explained as being due to small pulmonary or cerebral fat emboli. When fat in the urine is found with these symptoms, such an explanation is well substantiated and the diagnosis is more certain. Occasionally these are followed by more serious symptoms, but usually in a few hours they pass away and are forgotten. The other extreme is the acute and rapidly fatal form which is rarely differentiated from shock or collapse, is frequently unsuspected, and even if suspected, can rarely be diagnosed without an autopsy.

Between these two extremes there may be encountered the ordinary form of fat embolism. As an example of the symptoms to be met in a case of this kind, the history of Case 1 will be of interest, as it is, in most respects, typical.

The following symptoms and signs may be met with in the ordinary course of fat embolism:

An interval of euphoria; fat in the urine or sputum; extreme debility, anxiety, malaise, somnolence, pallor, cyanosis, cold extremities; respiration, rapid and irregular; dyspnea, cough, pain in side, hemoptysis, râles, edema or consolidation; pulse feeble, irregular and rapid; temperature, unreliable; loss or diminution of sensibility of the skin and reflexes, pupils contracted, Cheyne-Stokes respiration, spasm, convulsions, collapse, paralysis, coma.

These symptoms have been divided into cerebral and respiratory, but the division is not satisfactory, as the symptoms overlap so often that it is with the greatest difficulty that a given case may be confined to one of these groups. Such a differentiation may at times, at the onset, be satisfactorily established, but in the great majority of cases in a very short time both cerebral and pulmonary symptoms are present.

INTERVAL OF EUPHORIA.

Perhaps the most striking feature of fat embolism is the period of comparative well-being, in which there are no symptoms nor anything that might be construed as a warning. This interval, between the accident and the onset of the symptoms, is as characteristic as it is in the case of extradural hemorrhage, but not so easily accounted for. At first thought one would expect fat to act as does air when introduced into the circulation; that is, at once if it is to have any noticeable effect. But not so, the symptoms develop after a longer or shorter interval, and the interference with the blood stream is not at the center, the heart, but at the periphery of the circulation, the capillaries. There are various more or less plausible reasons to account for this delay in action, and, as is usual with numerous theories, none are entirely satisfactory.

One of the most commonly accepted is that a certain amount of pressure is necessary at the site of the trauma, before the liquid fat will or can enter the veins. This may be produced by the reparative action at the wound, by a continual bleeding from an artery, by a spasm of the muscles, a displacement of the fragments or various other causes.

Dejerine,[18] to show the influence of pressure *vis-a-tergo,* made experiments in which he introduced a laminaria tent into the marrow of the bone, and in such cases he found that the fat embolism was much greater than in those animals in which no tent was inserted.

Southam,[25] in this connection, says: "The taking up of the fat by the blood vessels from the medulla of the bone begins immediately after the receipt of the injury; and when an interval of time elapses before the symptoms of pulmonary embolism suddenly appear, may it not be explained on the supposition that the fatty matter, temporarily arrested or stranded in the vessels in the neighborhood of the wound, is after a time, when the patient has recovered from the shock of the injury and when reaction has set in, suddenly carried on with the blood stream under the influence of the renewed circulation until it is arrested in the vessels of the lung."

The fact that the fatty matter, when experimentally injected directly into the blood stream is rapidly carried to the remotest part of the body, is shown by Scriba,[23] when he found fat in the capillaries of the lung and in the tongue forty-two seconds after the injection. Flournoy[8] found fat in the capillaries in from one to two minutes after. And as showing this rapid absorption when not injected directly into the vessels, Hahn[13] reports an instance in which the animal was killed by chloroform asphyxia immediately after fracture, and he found numerous fat emboli in the lung, heart, liver and kidney. The entrance of the fat into the circulation must occur comparatively soon after the injury, because in the ordinary case the openings of the vessels would soon be closed by coagulation. The direct passage of the fat through the intact venous wall has been suggested.

Tillmann[44] says that, as a rule, death occurs in about three or four days after fracture, and in such cases there is a continual accumulation of the fat during the several days in the capillaries of the lung and brain which finally causes a more or less sudden functional incapacity of these organs. This explanation seems to be strengthened by the fatal case of Fibiger,[45] in which death occurred quite suddenly after the twentieth injection of olive oil (Leube's method).

Scriba[23] believes that at the end of seven or eight days the emboli in the different organs are set free and re-enter the circulation to form secondary emboli.

He also found by experimentation that the symptoms depended not only on the amount of fat injected, but also on the force and the relation (the nearness or remoteness) of the heart to the site of the injection.

43. Gwyer: Annals of Surgery, May, 1904.

44. Tillmann: Principles of Surgery and Surgical Pathology, 1894, p. 590.

45. Fibiger: Nord. Med. Archiv, March 10, 1900; editorial THE JOURNAL A. M. A., Aug. 11, 1900.

Another possible explanation for the delay in the appearance of the symptoms is that the fat is absorbed and brought into the blood stream by means of the lymphatics, instead of by the veins.

Busch[10] has shown that the fat might enter the circulation by the indirect route of the lymphatics. Weiner,[22] in 1879, was the first to demonstrate that fat might be absorbed from the serous sacs and by the lymphatics of the connective tissue spaces, even though these were unaltered.

The passage through the lymphatic glands, by this route, is time consuming, and accounts for the delay in the appearance of the symptoms. The effect on the fat by this transit through the lymphatic gland is somewhat of a question. Many authorities, notably Reidel[14] and Flournoy,[8] believe that the fat is emulsified and so rendered harmless by the lymphatic gland. But Weiner[22] has shown that the fat globules, after passing through the gland may unite and form drops capable of doing harm by obstructing the capillaries.

Clinically, the symptoms have appeared anywhere from six hours to the fifteenth day after injury.

FAT IN THE URINE AND SPUTUM.

A most important clinical sign of fat embolism is the presence of fat in the urine. It may appear in one or two forms: In one, the more grave, the fat or oil globule may be seen with the naked eye floating on the surface of the urine, a short time after it has been voided. In the other, the milder type, the fat can not be detected with the naked eye except as a cloudy layer on the surface after the urine has been allowed to stand for some time. This cloudy layer, when examined with the microscope, will be found to be composed of small globules of oil. They are often smaller than the red corpuscles, and seem to have no tendency to unite. If there is any doubt as to the identity of these round, highly refractive bodies, the addition of osmic acid causes a typical dark coloration.

As some fat gains admittance to the blood stream in practically all fractures, and as the bulk of this foreign material is eliminated by the kidney (some undoubtedly passes into the perivascular tissue and is oxidized, and some is taken care of by the leucocytes), therefore some degree of lipuria is to be found after all fractures.

Scriba[23] found fat in the urine of nearly all the fracture cases examined, Reidel[14] in 48 per cent., and Hahn[13] in 28 per cent.; the last two did not look for the fat in emulsion.

Fat is rarely found in the urine before the second or third day, and after that will be found at varying intervals of from two to ten days. It is only when the fat in the urine occurs with other symptoms of fat embolism that it should give rise to alarm. When found with other signs it will clear up the question of diagnosis, though, to be sure, other complicating conditions may be present also.

When in large amounts it has been considered as dangerous, even without other symptoms, and, on the other hand, it has been said that so long as there was a large amount of fat in the urine, the patient was in no danger from this source, as "the more fat in the urine the less in the circulation." It would seem that the accuracy of the last statement might reasonably be questioned.

In the absence of pulmonary or cerebral symptoms, the presence of lipuria may be looked on as a sign that the foreign substance is being eliminated satisfactorily.

Fat in the sputum may be recognized with the naked eye, or more frequently with the microscope. It will, generally, be mixed with blood, and is of great diagnostic import, as showing that the trouble in the lung has been caused by fat from one source or another.

DEBILITY, MALAISE AND ANXIETY.

The anxiety, pallor, cyanosis, followed by debility, malaise and somnolence, occurring among the first symptoms are rather difficult to explain unless it be on the supposition that they are due to embolic interference with the circulation of the cerebrum or medulla. Scriba,[23] after painstaking experiments, concludes that fatal fat embolism is due to multiple emboli, causing interference with the blood supply of the important centers of the brain or medulla.

RESPIRATION.

As regards the action of the lung, Scriba[23] has shown that all the fat in the marrow of a femur, when injected into the circulation was not sufficient to block enough of the capillaries of the lung to cause death.

Five-sixths of the arteries of the lung must be ligated before an animal will die, and at least three-fourths of the entire pulmonary circulation must be shut out before the least effect is noticed.

He concludes, therefore, that it is the fat that passes through the lung and lodges in the brain or spinal cord, which is the cause of the respiratory difficulty.

It is undoubtedly true that practically all of the signs and symptoms of the respiratory form may be caused by direct interference with the respiratory centers of the central nervous system. On the other hand, however, there is no question but that cases do occur in which the symptoms are practically entirely pulmonary.

The dyspnea is due to the deficient oxidation of the blood, be it due to either central or pulmonary changes; the hemoptysis is caused by infarction of the lung. The râles, the consolidation or the edema have been usually absent in experiments, but in the majority of clinical cases these changes in the lung have been marked.

Meeh[46] believes that the amount of embolism in the lungs may be sufficient cause for death in many instances, but that death may be due to embolism of different organs, and the brain is frequently involved.

HEART.

The heart's action becomes irregular, rapid and weak. The cause of this is more or less of a question. Bergmann,[7] Panum[47] and others considered the symptoms and death to be due to paralysis of the heart; and Rasmann found a decrease of arterial pressure, slowing of the pulse, and even arrest of the heart in diastole, to follow the injection of oil. Scriba,[23] by means of elaborate experiments, has shown that the presence of fat in the blood stream has no important effect on the heart's action, and that the only effect of this addition to the circulation was to give the heart more fluid to force onward.

Foxt,[48] in 1900, in his experiments showed that interference with the heart's action and even death might be caused by embolism of the coronary arteries. If

46. Meeh: Schmidt's Jahrbucher der Gesammten Med., 1892, vol. ccxxxiii xxxiv, p. 174.
47. Panum: Virchow's Archiv, 1862.
48. Foxt: THE JOURNAL A. M. A., March 2, 1901, p. 607.

the large trunks were obliterated, death might ensue very rapidly, and if the smaller branches, it might be delayed for an indefinite time. The interference with the normal heart action in fat embolism is evidently due to capillary embolism, be it coronary or pulmonary, or occurring in the capillaries of the brain or cord.

TEMPERATURE.

The temperature is, perhaps, the most perplexing and unsettled symptom of fat embolism. It is notoriously erratic and unreliable, and opinion is divided as to whether it is more often increased or decreased.

In most of the animal experiments with fat embolism, such as those of Czerny,[11] Hahn,[13] Scriba[23] and others, the temperature has been depressed.

Clinically, the temperature frequently has been found to be elevated in cases of this character. It is true there are often complications present which in measure might account for the hyperpyrexia. Wagner,[9] Busch,[10] Bergmann,[7] Stricker, Albert and Bilroth and many others believe that fat embolism is always accompanied by an elevation of the temperature.

Schwick, C. O. Webbe and Scriba,[23] on the other hand, emphasized a lowering of the temperature as a symptom of fat embolism, and Senn says:[49] "A high temperature always excludes fat embolism as the sole or principal source of danger and should always remind the surgeon of the necessity for searching for other complications that are responsible for the febrile disturbance." The increase of temperature in such cases is explained as being due to other causes, such as sepsis or ferment intoxication.

Roswell Park,[29] on the other hand, says, and is, perhaps, the more nearly accurate: "The temperature range is by no means constant; usually it is at first below the normal, and may in some cases remain so; in other cases it fluctuates from hour to hour, and may vary from the normal, by wide limits, either above or below. In other words, its range is atypical." Welch[50] likewise asserts that the temperature may either fall or rise.

Those who claim that the temperature is always normal or subnormal in cases of simple fat embolism do not present conclusive reasons why this should be the case.

It has been suggested that, possibly, this lowering of the temperature might be due to the deficient oxidation of the blood following the blocking of numerous capillaries of the lung. The intravenous injection of inert sterile foreign matter, such as flour, charcoal and other substances, has been found to be followed by an increase of temperature.

Schultze,[51] in 1897, reports a not uncommon case in which the subcutaneous injection of mercury was followed by a great dyspnea, with high fever but no pulmonary dullness. The attack was soon over and there were no bad results. Dimisch[52] found about 30 per cent. of subcutaneous fractures were accompanied by fever. It has been said that the only way to explain the occurrence of a temperature after the injection of foreign aseptic material is that this foreign matter destroys the corpuscles of the blood with a consequent liberation of fibrin ferment, which is capable of causing a rise in the temperature.

The early work of Magendie[1] and others on the viscosity of the blood has shown that after shaking a mixture of freshly drawn blood and oil there resulted a breaking up of the red cells. Other experimenters have failed to note any marked change in the composition or the character of the blood after the addition of oil to the circulation in the body, this discrepancy being explained on the supposition that the agitation, and not the addition of the oil, was the cause of the alteration in the red cells. If the injection of sterile substances other than oil is followed by a temperature it would seem reasonable that the injection of oil might act in the same manner.

The frequent association of fat embolism and sepsis is readily admitted, as is also the difficulty at times in satisfactorily separating the two conditions. In many cases of fat embolism with elevated temperature sepsis may be practically excluded, and it is difficult to understand the cause of the temperature if it is not due to the emboli.

Scriba[23] considers a rise of temperature in these cases to be due to sepsis, and even looks on the condition of fat embolism as advantageous in preventing or retarding the entrance of this sepsis into the general circulation, by obstructing the capillaries. Again, the subnormal temperature in simple fat embolism may be due to an interference with the centers of the nervous system which regulate the production and dissipation of the body heat. This seems to be the most rational explanation, but if such were the real conditions it would seem that occasionally, at least, the interference with the blood supply of these centers by embolism might cause an increase instead of a lowering of the temperature.

Hamig[53] in all of his five cases found a rise of temperature similar to that which occurs in aseptic fever, and in explanation gives as a cause some alteration of the heat centers.

As showing that clinically, in fat embolism, the temperature may be elevated, we find that authors report as follows:

Egli Sinclair[20] stated in the symptoms, "the temperature is high." Smirnoff[54] likewise considers high fever to be a symptom. Skirving[28] found a temperature of from 100 to 104, and after death, 105. Czerny,[11] 103.4; Fenger,[24] 101.3; Southam,[55] 101.2, 103, 105; Southam,[55] 100.4, 100, 98.6; Lowe,[56] 101.8; Bard,[57] 102; Zwick,[58] 99.5; Svetchnikoff,[59] temperature rose; Bonine and Belknap,[60] 103; Flournoy,[8] 104, 102.9, 102; Minich,[31] 104, 99.6, 98.6; Whitney,[61] 99, 101.5, 100, 101,98; Preidelsberger,[62] 101; De Groube,[63] temperature dropped just before death; Colley,[30] 101.3, 106; Colley, 100.5, 102.5, 104; Hamig,[53] 99, 101, 103.5, 104.5; 101.8, 104, after death 109; 101.8, 105, 106; 101.6, 104, 104; 102, 104.5, after death 106; Pomatti, 99.6, 103.6, 105.8; Demisch,[52] 104.3; Ribbert,[25] 98.6, 100, 100; 98.2, 102.3, 103.8, 103.2; 86, 103.4, 103.6, 103.8; Bailey,[17] 104, 103; Bergmann,[64] 103.

In these 29 cases fat embolism occurred 18 times after simple fracture, 6 times after compound, and once after a fracture the variety of which was not mentioned. It occurred after orthopedic manipulations three times and once after a punctured wound of the soft parts of the leg.

49. Senn: Principles of Surgery, 1890; Practical Surgery, 1901, p. 347.
50. Welch: Allbutt System of Medicine, 1899, vol. vii, p. 228.
51. Schultze: Cent. f. Chir., Aug. 21, 1897.
52. Dimisch: Cent. f. Chir., 1886, p. 182.
53. Hamig: Cent. f. Chir., No. 35, 1900.
54. Smirnoff: Chirurgia, July, 1903.
55. Southam: Lancet, May 3, 1902.
56. Lowe: Jour. Anat. and Phys., vol. xvi, Saundby and Barling.
57. Bard: Trans. Med. Soc. of California, 1894, p. 128.
58. Zwick: Deut. med. Woch., No. 32, Aug. 8, 1883, p. 469.
59. Svetchnikoff: Mediziniskiva Prob., June, October, 1899.
60. Bonine and Belknap: The Phys. and Surgeon, February, 1886.
61. Whitney: Boston Med. and Surg. Jour., 1892, No. 7, p. 159.
62. Preidelsberger: Zeit. f. Heilkunde, vol. xxiv, 1903, No. 3.
63. De Groube: Revue de Chir., 1895, vol. xv, p. 577.
64. Bergmann: Berl. klin. Woch., Aug. 18, 1873.

While searching for these cases of fat embolism in which there was a temperature, there was noted reports of eight cases in which the temperature was normal or subnormal.

With my two cases, the temperature was, therefore, noted in 39 cases, and of these 31 were accompanied by a rise of temperature and 8 by a normal or subnormal temperature.

LOSS OR DIMINUTION OF SENSIBILITY OF THE SKIN AND REFLEXES.

The symptoms to be classed under this division are unquestionably to be explained as being due to interference with the central nervous system. They are in a great majority of fatal cases the terminal symptoms.

DIFFERENTIAL DIAGNOSIS.

In 1864 Flournoy[8] was the first to recognize this condition as a cause of death. Lucke was the first to make a diagnosis during life in a case of fracture of the leg in which there occurred acute interference with the respiration. Bergmann[64] made a diagnosis of this condition during the life of the patient in the same year, 1873.

In America, the first diagnosis was made by the late Christian Fenger[24] in 1879. Since then it has been recognized with increasing frequency, but is evidently still frequently overlooked or mistaken for some other condition. Among the conditions more likely to be confused with fat embolism may be mentioned: Shock, septicemia, pulmonary embolism and less commonly the effects of anesthetics, congestion of the lung or kidneys, cerebral hemorrhages, concussion of the brain, or atheroma of the coronary arteries.

The symptoms of shock will have practically disappeared by the time that those of fat embolism are beginning to make themselves manifest. In the rapidly fatal cases of shock after fractures it has been suggested that fat embolism in some cases may be an important element.

Septicemia is usually a later development than is fat embolism, but we have seen that a low temperature is neither a constant nor an established symptom of fat embolism. An irregular and at times a marked elevation of the temperature is to be noted.

The occurrence of shock, to which is added fat embolism, and on which is engrafted a sepsis, is not uncommon after a severe traumatism, and when it does exist it is a formidable combination to recognize and separate.

In this connection the case of Southam,[55] in 1880, is of interest. On the second day after compound fractures of both legs, followed by double amputation, the patient developed typical symptoms of fat embolism and the temperature went up to 105 F. Discoloration of the stumps, with a characteristic odor, showed that putrefactive changes had taken place. Microscopic examination of the lung showed fat embolism. In his mind the diagnosis lay between fat embolism of the lung and the acute form of septicemia, the "collapse with cyanosis" of Bilroth.

Embolism due to the dislodgement of a portion of a venous thrombus may resemble fat embolism very closely, but its onset is usually very sudden; on about the third week after the accident the symptoms are almost entirely pulmonary and cardiac, and the course is usually rapidly fatal. The time of these complications of fractures has been well emphasized by Dennis[65] in the following manner: Shock, 3 hours; fat embolism, 3 days; pulmonary embolism, 3 weeks.

In cases where an anesthetic has been administered the irritation of the lung and kidney may cause symptoms resembling those of fat embolism; also congestion of these organs from causes other than anesthetic or fat embolism sometimes may give rise to confusion, as may likewise the affections of the brain and heart mentioned above; usually, however, the symptom complex and a careful physical examination will clear up the cause of the condition.

Welch[50] considers the detection of fat emboli in the pulmonary vessels to be of medicolegal value in determining whether injuries have been inflicted before or after death.

PROGNOSIS.

The prognosis of fat embolism is most uncertain; perhaps the chief factor in this uncertainty is that its frequency is unknown. Baum, in 366 cases of fracture, found death due to fat embolism in 7 instances. Lucke,[64] in 232 fractures, found only one death due to this cause. Mumford, in 300 cases of compound fracture at the Massachusetts General Hospital, found three deaths due to fat embolism.

It undoubtedly occurs in a mild form, and, therefore, is not recognized, after a large proportion of fractures. The reason why this fat does not cause serious embolism of the lung in many cases is explained by Moullin[26] in the following manner: The globule of oil in the blood stream, by the force of the heart's action and impact against the vascular wall, especially at the dichotomous division, is broken up into very small droplets that are able to go through the pulmonary capillaries without causing obstruction.

The presence of the oil in the circulation has no deleterious effect on the constituents of the blood; its sole action is a mechanical one, in obstructing some of the finer capillaries of the periphery, and is finally removed from the circulation by the leucocytes, by phagocytosis, by passing into the perivascular structures and there being oxidized, or by the manner in which the largest part is eliminated, by the kidney.

Lipuria has been found to be an almost constant accompaniment of fractures, and operations on bones, but only rarely does it give rise to serious symptoms.

Fat embolism also escapes detection when it occurs in a severe type and is confused with shock, collapse, the effects of anesthetics or sepsis.

Flournoy[8] and von Recklinghausen searched for evidence of fat embolism in 250 consecutive autopsies, and found it more or less diffuse in 10 per cent. Carrara[33] examined 102 bodies and found fat embolism in 28. C. W. M. Moullin[26] found fatty emboli in 12 out of 14 consecutive postmortems, in which, with one possible exception, there was no suspicion of its existence during life. Saundby and Barling[27] examined 8 cases in which death followed injury to the bone, and found fat embolism in all.

The mortality rate is very indefinite, and, it might be said, unknown. Meeh,[46] in 1891, was able to collect 111 cases in which the death was attributed to fat embolism, and after an analysis of these cases he could only find 13 that, in his opinion, were not fatal because of some other complication. Flournoy[8] was able to collect 140 cases of fat embolism, 13 per cent. of which died because of this condition. In 300 cases of compound fracture at the Massachusetts General Hospital, from 1887 to 1895, Mumford found a mortality of 30, 10 per cent.

65. Dennis: Surgery.

Of these 30, 3 (10 per cent.) died because of fat embolism. Scriba[23] found, experimentally, that the result depended on the amount of fat, the force and rapidity with which it was introduced, and the proximity to the heart to the site of the injection.

TREATMENT.

The treatment of fat embolism is most unsatisfactory; in fact, it may be said that there is no treatment.

Prophylactic treatment should be instituted immediately after the injury has been received and will consist of careful handling of the limb, so as to do as little additional injury to the fat cells as possible. All of this is demanded by Nature because of the pain that results when these precautions are not carried out. But when the patient is unconscious, and no pain is felt, the same care should be exercised in moving or manipulating the limb. The proper approximation of the fragments and their immobility are, perhaps, the only effort that can be made to prevent the occurrence of fat embolism.

Many theories have been advanced as to the proper line of treatment, but, unfortunately, none are of great practical value. If a closed wound, drainage should be established, in the hope of relieving the tension, and so preventing the further absorption of the fat. The proximal ligation of the veins, and even phlebotomy, have been recommended, with about the same object in view.

Attempts have been made to emulsify the fat in the blood by the injection of a weak solution of sodium bicarbonate. Normal salt solution has been injected with the object of diluting the blood, and ether has been injected for the purpose of absorbing the fat. Oxygen is most certainly indicated for the carbonic acid poisoning. As the chief part of the fat is eliminated by the kidney, attention should be given to these organs. But perhaps the all-important element of the treatment is to watch the heart's action and keep it going by stimulants as long as possible. If the force of the heart can overcome the fatty capillary obstruction, then the outcome is much more favorable. First the fat must be forced through the pulmonary capillaries and then through the capillaries of the systemic circulation.

Therefore, it would seem that judicious heart stimulation is about the only treatment available for this condition at this time, as it is of numerous other conditions.

CASE 1.—Compound comminuted fracture of left tibia and fibula. No medical attention for nine hours after accident; rough transportation. On the fifth day respiratory symptoms appeared, the temperature was high; on the sixth day sudden and marked fall of temperature and the onset of cerebral symptoms. Fat found in sputum and urine. Symptoms persisted for about five days, and then gradually disappeared; ultimate recovery.

Patient.—Mr. I. W., 33 years; Scandinavian, lumber man. Family, personal and previous histories negative.

Present History.—While engaged in moving timber at about 8 o'clock on the morning of Dec. 15, 1902, he slipped and a heavy log rolled over his left leg. He was thrown into the snow, and was unconscious for about an hour; he then regained consciousness and called for help, but it was not until five hours after the accident that he was found. In the meantime he had suffered extremely from the cold and believed that his foot was frozen. As there was no means of transportation other than horseback, his leg was crudely bound up with some sticks, and he got into the saddle, and, with a companion on each side, rode for two miles to the nearest railroad station. After a ride of 50 miles on the train he arrived at St. Vincent's Hospital at 5 o'clock in the afternoon, having received no medical attention of any description since his injury.

Examination.—Examination revealed a muscular, well-developed man, somewhat pale, but cool and collected. The clothing of the damaged limb, which had not been disturbed, was saturated with blood, the foot was strongly inverted, and there was a false point of motion and crepitus, with pain. After the removal of the clothing, the tibia was found to be broken at about the junction of the middle with the lower third, and the fibula about three inches higher. The skin covering the crest of the tibia at the site of the fracture was torn in a direction transverse to the long axis of the limb. About two inches of the upper fragment of the tibia protruded from this wound and rested on the skin of its lower lip.

Treatment.—After an ineffectual attempt to reduce this protruding end of the tibia, the inferior margin of the wound was incised parallel to the long axis, and the bone replaced. On digital examination there was found considerable clotted blood, and a large piece of the crest of the tibia. These were removed, the fragment of the tibia was entirely denuded of periosteum; it was two inches long, an inch wide and a quarter of an inch in thicknesss. A blunt forceps was now introduced through the soft parts and made to present on the posterior surface of the leg, and by means of a button-hole the forceps were passed through and tubular drainage effected. The wound was thoroughly irrigated and cleansed, the ends of the bones placed in apposition, an ample wet dressing applied and the leg put in lateral splints.

All of this was done without any anesthetic, either local or general.

Subsequent History.—On admission to the hospital the temperature was 99. The second day, in the evening, there was a slight rise of temperature to 100.2. On the third day there was no marked change in his condition, except that the temperature reached 102.6 and the pulse had slightly increased. On the fourth day the temperature became alarming, 103.4, but the pulse did not go above 118 and was full and strong. The dressings were changed and the wound examined, but no accumulation of pus could be found, nor was there any evidence of infection; the drainage tube was open. After the renewal of the dressings and free evacuation of the bowels the temperature dropped 2 degrees. Previously his nights had been fairly comfortable and he had been able to sleep as well as could be expected, but in the night between the fourth and fifth day he was unable to sleep, was very restless and seemed short of breath. During the fifth day he manifested signs of interference with respiration, complained of slight pain on both sides of the chest, dyspnea, slight cough with scanty blood-stained sputum; his face became cyanotic and the expression worried. He did not complain of pain in his leg. The temperature was again high. The dressings were removed and the wound once more inspected, but no evidence of any retention of pus or wound secretion. Physical examination of the heart and lungs was negative. He passed a very restless night. Early in the sixth day the pulse and temperature dropped, the temperature descending from 103.6 to 99.4 between 2 a. m. and 1 p. m. The dyspnea increased, and in the afternoon he sank into a sleep and could only with difficulty be aroused sufficiently to take nourishment or medicine. A very profuse bloody froth accumulated in his mouth, the breathing was irregular, there was marked pulsation of the jugulars, the pupils were contracted but responded to light, the reflexes were apparently normal, large moist râles, were heard over both lungs, but there was no dullness. For the first time fat was noticed in the frothy sputum, and an examination of the urine revealed the presence of fat in large globules.

The seventh day was quite similar, there being little if any change in the condition of the patient. He slept all of the time, but could be roused, and at times seemed quite rational; in answer to questions, he was always feeling "pretty good," and had no pain.

The eighth day was about the same as the two preceding days. Fat was no longer to be found in the sputum, which also seemed to be diminished, and the dyspnea seemed not so marked. The temperature was irregular.

During the ninth day all of the symptoms improved; he became wakeful and more rational, but had no recollection of the

time since he had been hurt. From then on he gradually improved, and by the twelfth day he was about as well as could be expected.

The leg finally united after about eight months, during which time various procedures not germane to this subject were gone through with.

The ultimate result was a good union, with about an inch of shortening.

The appended chart of the time that the symptoms of fat embolism were prominent, may be of interest. (Chart 1.)

CASE 2.—Compound fracture of left femur; did well for 15 days, then for one week had pulmonary symptoms of fat embolism, with lipuria and fat in the sputum and an inguinal phlebitis. Recovery. On the forty-third day after the receipt of his injury, after sitting up for the third time, he had a return of all the embolic symptoms, which persisted for about a week, terminating in recovery.

Patient.—Mr. E. J., 35 years, Scandinavian, miner. Family, personal and previous histories negative.

Present History.—While at work, slipped and fell, his left thigh being caught between a platform and a heavily loaded descending "cage." He was held, pinned in this manner, for some few minutes, before the cage was lifted and he could be taken out. He experienced great pain and was unable to stand or walk. He was removed as soon as possible to St. Vincent's Hospital, a distance of about four miles, over rough mountain roads.

Examination.—On admission, about two hours after the accident, pulse was good, the patient seemed in good general condition, and there was present no evidence of shock. Examination revealed crepitus and a false point of motion in the thigh at about the junction of the lower with the middle third. There was a marked deformity; the upper fragment was displaced forward and outward, causing shortening and eversion of the foot. There was a bruise of the soft parts on the internal aspect of the thigh; on the outer side of the thigh, and higher, there was a similar bruise, with a punctured wound about one-half inch in diameter. From this wound the blood was flowing, but in a moderate amount.

Treatment.—The limb was cleansed, shaved and the wound swabbed out with carbolic acid, followed by alcohol. A wet dressing was applied, the limb put in splints, and the next day a Buck's extension applied.

Subsequent History.—The wound of the soft parts healed by first intention, and the bony union seemed to be progressing favorably. During the afternoon of the fifteenth day, the intervening days being practically normal, he complained of not feeling well, was short of breath, restless and uneasy. His temperature in the morning was normal and in the afternoon 99.6. At about midnight he began to cough and have a sharp pain on the left side under the shoulder blade. The next morning his temperature was normal, but it gradually crept up till on the eighteenth day it reached 102.6, after which it gradually declined. The cough and expectoration, containing blood and fat, with dyspnea, rapid and irregular action of the lungs and heart, with restlessness, anxiety and sleeplessness, all of which continued for about one week.

Physical examination of the chest during this time showed at first large, moist râles, with slight tympany; later there was evidence of consolidation over the base of each lung. Fat in the sputum persisted for two days, and then could be detected in small amounts for two more days. In the urine fat was detected every day for a week.

At no time did the patient have any marked manifestations attributable to interference with the central nervous system.

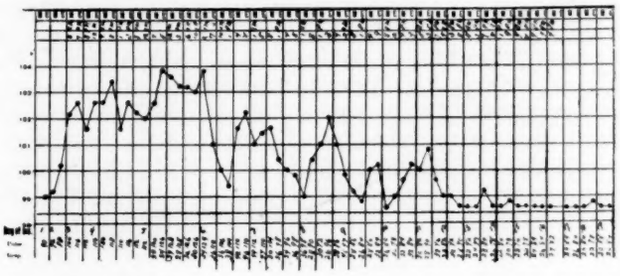

Chart 1.

He was extremely anxious, restless and apprehensive of a fatal termination, but these were the only symptoms that could possibly be considered as originating in the nerve centers.

On the day following the onset of these symptoms, the sixteenth, he complained of pain in the left groin; examination at this time revealed nothing, but the next morning there was a distinct swelling of the entire limb, more noticeable in the thigh than in the leg. The skin was slightly darker in color and a marked tenderness in the neighborhood of the saphenous opening. Under appropriate treatment the pain disappeared in a few days, but the swelling remained, diminishing slowly, for a number of months.

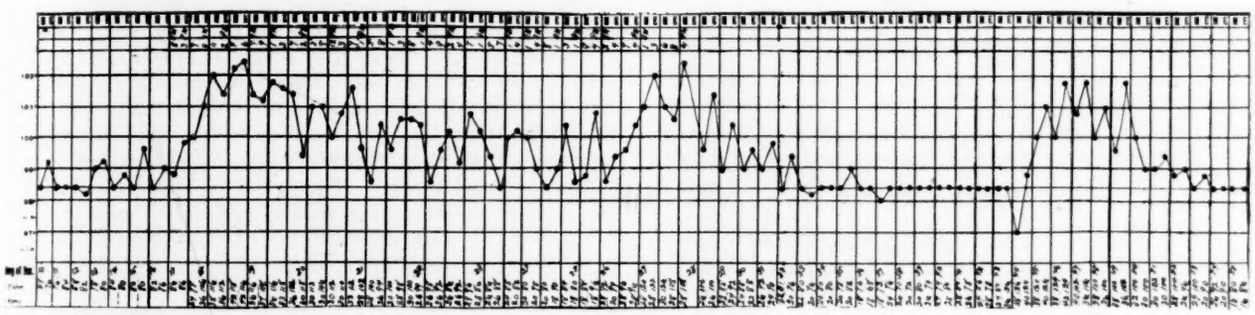

Chart 2.

An irregular temperature persisted after the lung and other symptoms had entirely passed away. No rational explanation for the persistency of the temperature could be given; and in spite of it the patient seemed to be progressing very favorably, and finally it became normal.

He had been sitting up in bed, with the aid of a head rest, for some time, and on the forty-second day he was allowed to sit in a chair, half an hour in the morning and the same time in the afternoon. No bad effects were noticeable. On the forty-third day he sat up in the morning, but did not do so in the afternoon, as he did not feel well; it seemed difficult for him to breathe, and he had a slight pain on the left side of the chest in the anterior axillary line. He said that he did not fall or slip in any manner, nor did he jerk the leg. The leg and groin felt just the same as they had for the past weeks, nor did an examination show any change. Temperature was normal and a physical examination of the chest failed to give a reason for his pain.

The next morning the temperature was subnormal, pulse rapid, and the dyspnea, cough, pain and other lung symptoms practicallly the same as those experienced in the third week. Fat was found in the sputum during the morning of the forty-

fourth day, but not so abundantly as it was in the previous attack, nor was it found after this morning. In the urine fat was found, in small amounts, for three days. Within six days these symptoms had diminished so as to be practically unimportant. (See Chart 2.)

Nervous symptoms, except those of anxiety, worry and restlessness, were also present in this second attack, as they had been during the first. The final result of the case was a perfect recovery.

Up to the year 1884, Reiter[66] was able to collect 207 cases. Since that time we have noted the following cases:

1884. Roth:[67] Fracture; death.
1884. Roth: Fracture; death.
1884. Park:[29] Fracture: death.
1884. Park: Operation on bone; death.
1884. Park: Operation on breast; death.
1884. Socin:[68] Fracture; death.
1886. Bonine and Belknap:[28] Fracture; recovery.
1186. Wahncan:[69] Fracture; death.
1886. Demisch:[62] Fracture; recovery.
1888. Coats:[70] Fracture; recovery.
1892. Whitney[61] Fracture; recovery.
1893. Colley:[30] Orth. operation; death.
1893. Colley: Orth. operation; death.
1893. Colley: Fracture; death.
1893. Colley: Fracture; death.
1894. Bard:[57] Fracture: death.
1894. Ribbert:[71] Fracture; death.
1894. Hirsch:[72] Fracture; death.
1894. Ribbert: Fracture; death.
1894. Finnotti:[73] Fracture; death.
1894. Ribbert: Fracture; death.
1895. DeGroube:[65] Fracture; death.
1895. Ahrens:[74] Orth. operation; death.
1896. Lympius:[75] Orth. operation; death.
1898. Payr:[76] Orth. operation; death.
1898. Payr: Resection of knee; recovery.
1898. Payr: Resection of knee; recovery.
1898. Payr: Resection of knee; recovery.
1898. Eberth:[21] Orth. operation; death.
1899. Payr:[30] Orth. operation; death.
1899. Payr: Orth. operation; death.
1899. Payr: Orth. operation; death.
1900. Fibiger:[45] Leube's method; death.
1900. Svetchnikoff:[59] Fracture; death.
1900. Pomatti: Fracture; death.
1901. Engel:[39] Rupture of liver; death.
1902. Euphrat:[77] Fracture; death.
1902. Southam:[65] Fracture: recovery.
1903. Preindelsberger:[62] Orth. operation; death.

		Recoveries.	Deaths.
Fractures	22	3	19
Writer's cases	2	2	0
	24	5	19
Orth. operations	14	3	11
Amputation of breast	1	0	1
Rupture of liver	1	0	1
Leube's method	1	0	1
	41	8	33

DISCUSSION.

DR. C. H. LEMON, Milwaukee, Wis.—I have had two cases of fat embolism of the lung following multiple fractures, and it has been surprising to me how few of these cases have been recognized. I am satisfied that many cases of fat embolism occur, but the symptoms are not recognized or are attributed to other causes. I was interested to learn that fat globules are so frequently found in the urine. In both of Dr. Connell's cases the fat embolism occurred in compound fractures, but the cases in which it occurred in my practice were simple fractures. It is rather astonishing to learn that fat embolism occurred in compound fractures, as we would expect the fat to escape with the wound secretion. In my cases the temperature was not higher at any time than 103. The lung symptoms appeared on the third day in one case and on the fourth day in the other. One case had considerable cough and expectorated a bright, bloody fluid. These symptoms lasted but two days and then subsided.

DR. JABEZ N. JACKSON, Kansas City, Mo.—This is a condition which very frequently passes unrecognized, and it is important that more attention should be given to its recognition. I have seen several cases of this condition and have heard others reported under various erroneous diagnoses. Frequently it is difficult to make a positive differential diagnosis except by close exclusion. In one of my cases the symptoms were apparently identical with those of a very severe hemorrhage, and a diagnosis of this character was made by my hospital internes. The case in point was one of extensive comminuted fracture of the femur, and the signs of embolism presented themselves about eight hours after the injury. These signs of embolism came on very suddenly and consisted of a very rapid and feeble pulse and a correspondingly shallow and rapid respiratory rate, with the anxious expression so often seen in shock or hemorrhage. The diagnosis of hemorrhage was only excluded after a thorough examination of the seat of fracture, where no hematoma nor other evidence of hemorrhage was present and where there was no other injury to cause a hemorrhage elsewhere. There was, however, a little swelling and tension beneath the fascia of the thigh. I think that the character of the fracture has much to do with the occurrence of fat embolism. Two conditions are certainly favorable to embolism, first, fat globules in a free state, and, second, tension to force these globules into the circulation. Comminution of the fracture by crushing liberates the free fat. If now, from contusion locally, the extravasation is increased without rupture of the fascia, it will have a condition of extreme tension, which will favor the forcible squeezing of the fat into the mouths of open vessels. The period at which the signs of embolism appear will likewise be modified to some extent by these same conditions. Where the exudation or extravasation occurs rapidly and rapid local tension is produced, it is probable that the signs of embolism will appear more early, as was the fact in the case of my own to which I have alluded. Correspondingly, in a simple fracture with little local extravasation, the signs of embolism would probably appear later, if at all. I feel assured that this is worthy of more attention by the profession, as many cases at present undoubtedly occur and are not recognized.

DR. J. E. SUMMERS, JR., Omaha, Neb.—I believe rough manipulation and improper fixation have something to do with the causation of this condition. We can surely help some of these conditions. Manipulation should be reduced to a minimum and the fixation should be as good as possible.

66. Reiter: Jahresbericht der Medicin, 1886, vol. i, p. 257.
67. Roth: Revue de Chir., vol. xv, 1895.
68. Socin: Jahresbericht über die Chir. Abteilung des Spitals zu Basil Fur., 1883-84.
69. Wahncau: Inaug. Diss., Halle, 1896.
70. Coats: Glasgow Med. Jour., 1888, vol. xxix, p. 431.
71. Ribbert: Corresblat. f. Schweizeerzte, 1894.
72. Hirsch: Brit. Med. Jour., July 7, 1894, p. 13.
73. Finotti: Deut. Zeit. f. Chir., 1894, vol. xxxix, p. 508.
74. Ahrens: Beit. f. klin. Chir., vol. xv.
75. Lympius: Cent. f. Chir., 1896, p. 800.
76. Payr: Munch. med. Woch, July 28, 1898, No. 28, p. 885.
77. Euphrat; cut. med. Woch., July, 1902, No. 29.

DANGERS FROM INDISCRIMINATE USE OF CATHARTICS IN ACUTE INTESTINAL CONDITIONS.

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CHICAGO.

Almost from the beginning of time man seems to have been possessed of an intuitive feeling that an acute abdominal affection, accompanied by an arrest of intestinal action, is an extremely serious condition which, if not soon relieved, must lead to a fatal issue.

In such cases, the laity realize the importance of proper bowel movements, and, having observed the relief which is often experienced when the interrupted bowel action is resumed, immediately resort to the use of cathartics to bring about the desired end, namely, a movement of the bowels.

Unfortunately, this intuitive feeling seems to be so deeply rooted in the mind of man that even a study of the science and art of medicine at times fails to dislodge it; for one too often sees otherwise intelligent physicians following it blindly, to the destruction of their patients, and without regard to the cause of the arrest

of the bowel action which they seek to restore. Not much is to be hoped for from the laity in this matter, but something should be expected from the intelligent physician.

In considering the numerous acute affections of the abdominal viscera, which are accompanied by a suspension of bowel movements, it should be understood and remembered, and never forgotten, that no patient ever dies simply because the bowels do not move.

It is well known that a person may go for days or even for weeks without a bowel movement and still continue at his usual vocation with little or no apparent inconvenience. But let the intraintestinal current be suddenly arrested by some acute affection, and the individual is at once brought low and the seriousness of the condition is so visibly stamped on every feature that he who runs may read. Wherein does this latter case differ so materially from the former?

It differs from it in this important fact, namely, that some distinct pathologic condition has placed its grip on some portion of that intestinal tract and thereby produced such a trauma as not only to interrupt its function, but also, if unrelieved, to lead to its local destruction.

The particular pathologic condition may assume a variety of forms which will be mentioned later. The fact which it is desired to emphasize as strongly as possible at this point, is that the patient's danger lies not in the fact that his bowels do not move, but in the condition which produces the obstruction, and as a corollary to this it follows that the administration of cathartics of any and of all kinds under these circumstances, with the idea in view of attempting to force a bowel movement, is not only irrational and illogical, but often productive of the greatest harm to the patient.

So far as the conditions at present under discussion are concerned, cathartics may be described as acting in two ways, namely, by stimulating peristalsis and by increasing the amount of fluid in the intestinal tract.

Let us consider first, then, those cases in which there is a complete mechanical closure of the lumen of the bowel, such as occurs in strangulated hernia, either external or internal; in compression of the bowel beneath peritoneal bands; in strangulation by reason of a loop of bowel becoming caught in an omental or mesenteric opening; in adhesions of the bowel producing kinking; in volvulus, etc. It is very evident in these cases that no cathartic, however strong it may be, is capable of overcoming the obstruction.

Under these circumstances the effect of all cathartics is harmful. That portion of the intestine lying cephalad of the obstruction is filled with fluid which favors the putrefactive changes constantly taking place. The intestinal contents are churned back and forth by the increased peristalsis, and, finally, not being able to pass the seat of the obstruction, are forced in a reverse direction back into the stomach, thus giving rise to the foul, offensive vomiting so characteristic of the condition. The stimulated peristalsis forcing the intestinal contents against the obstruction increases the strangulation and hastens the sloughing or cutting through of the bowel at that point. It produces dilatation and congestion of the proximal loops of the bowel, with small mucous and submucous hemorrhages and venous thromboses which lead to the formation of small ulcers, if time permit, often with minute or pin-point perforations, all of which permit and favor the passage of microbes into and through the intestinal wall into the peritoneal cavity, with the production of a fatal peritonitis.

In invagination also the harmful effects of cathartics readily may be seen, for the increased peristalsis can have no other effect than to still further increase the invagination; and the intestinal contractions must augment the congestion and swelling of the intussusceptum, and thereby earlier lead to complete obstruction and sloughing.

It is well known that complete paralysis of a portion of the intestine, such as occurs in somewhat localized inflammatory conditions, as, for instance, a sigmoiditis, or where a portion of the intestine has been suddenly deprived of its blood supply as in thrombosis of the mesenteric arteries, may block the passage of the intestinal contents at times almost as effectually and completely as if a mechanical obstruction were present.

The harmfulness of cathartics in the former case will be shown presently while their futility in the latter is apparent, as these patients all die within a short time from sloughing of the bowel and peritonitis, unless relieved by early operation.

We now come to that rather indefinite class of cases in which intestinal obstruction is due to a paralysis of the intestinal wall, or to a more or less localized spastic contraction of the same from unknown causes. To this class, undoubtedly, belong those cases of obstruction which undergo a spontaneous recovery or which recover under medical treatment.

It can not be said that the exact pathology of these cases is clearly understood, but that such cases occur seems certain. We are led to this conclusion, not only by force of reasoning from the cases that recover, but also by the fact that cases presenting symptoms of mechanical obstruction have been operated on and nothing but a paralytic or a spastic condition as mentioned above found.

Heidenhain[1] has collected some of these cases and presented them in a very interesting manner. The failure of repeated doses of cathartics to bring about a bowel movement is particularly noted, while, on the other hand, the beneficial effects of antispasmodics, such as opium, were shown in some cases. It is probable that to this class of cases belong those which have apparently recovered after the hypodermic injection of large doses of atropin, as has recently been recommended.

The last class of cases to be mentioned is that in which an acute peritonitis, more or less circumscribed, is the chief pathologic condition, be its origin in the appendix, the fallopian tube, the gall bladder, an intestinal perforation or other structure.

The increased peristalsis produced by cathartics in the early stages of these cases may not only break up the delicate circumscribing adhesions just forming, but may also favor and aid the distribution of the infection throughout the peritoneum.

It will thus be seen that in the great class of cases herein under consideration, the use of cathartics, as a rule, is positively injurious to the patient.

But there is another very important reason why they should not be given. For years the surgeon fought against the indiscriminate use of opium in these cases because it so masked the symptoms as to lead to an erroneous diagnosis or induced in the patient an apparent feeling of betterment which was but false and which but too often led to a fatal procrastination in seeking the necessary surgical relief.

1. Arch. für Chir., vol. lv, p. 211.

So, too, the administration of cathartics in these cases frequently so clouds the clinical picture as to make an accurate diagnosis of the case impossible. This was very forcibly illustrated to me during the past year.

Patient.—A strong, healthy young man, aged 30.

History.—After a few days of general malaise and irregular diarrhea he was seized on July 9, 1904, with chilly sensations followed by nausea, vomiting, rise of temperature and complete constipation with general abdominal pain. Toward evening of the same day he experienced severe pain in the lower left side of the abdomen, radiating upward toward the chest. The pain was paroxysmal in character and was somewhat relieved by an enema.

Examination.—A tender, elongated mass easily could be made out in the region of the sigmoid flexure. The next day he was brought to the hospital with a diagnosis of probable invagination, and I saw him in consultation that evening.

Diagnosis.—I made a diagnosis of sigmoiditis, based on the location and general outline of the mass in the abdomen, the tenderness, vomiting, rise of temperature and complete constipation. Intussusception was excluded because there had been no mucous or bloody stools which most likely would have been present in an intussusception of that portion of the bowel. Operation was, therefore, not advised. Unfortunately, during that day he had taken cathartics in the shape of repeated doses of calomel and Epsom salts. During the night these began to work and he had some mucous stools containing blood. When these stools were shown to me the next morning they cast enough doubt on the diagnosis of sigmoiditis to induce me to open the abdomen, thinking, perhaps, that I had made a mistake and that the mass was really an invagination.

Operation.—I found a simple sigmoiditis. The sigmoid and lower end of the descending colon were inflamed, thickened and somewhat edematous, but there was no sign whatever of an invagination. The abdomen was closed and the patient recovered without any unfavorable symptoms.

Had this patient not been given the cathartics, which could have done him no good under any circumstances, he would not have had his clinical picture clouded and would have escaped an unnecessary operation.

The time to make a correct diagnosis in acute surgical affections of the abdomen is in the beginning of the trouble. In the early stage of the large majority of these cases a careful examination of the abdomen by sight, palpation and percussion, will enable one to make a correct diagnosis of the conditions present.

The exact point of greatest tenderness, the location of an inflammatory mass, a distended loop of bowel, a loop of bowel which is tender or one which is fixed to some particular spot, the presence of collapsed or distended loops to be felt on rectal examination, visible peristaltic waves which are general or limited, a mass in the region of hernial openings, are all points of the greatest importance in making up a diagnosis, but they are also points which are lost during the later stages or when the intestine has become distended and disturbed in its relations by the injudicious administration of cathartics.

How often the surgeon is called in near the end to find a patient with an abdomen so distended as to render it absolutely impossible to outline anything within it; a patient so restless as to be unable to remain quiet a minute; with hollow, sunken, tired, wide-awake eyes from which sleep has been banished for many hours; a mind clear and active to all that transpires about him, but totally indifferent to his own hopeless condition; with lips that are red, parched and hot, made doubly so by the constant sucking and swallowing of cracked ice, which is but heaping coals on the fire. By his side there is a bowl into which every few minutes he vomits a quantity of dark greenish or blackish foul, offensive fluid; indeed, it seems to run out so easily that it can scarcely be called vomiting, and while one sits and meditates on the lost opportunity and the almost hopelessness of the situation, he listens to the tale of the patient or of the nurse, or alas! at times of the attending physician, of the repeated doses of castor oil, of calomel, of salts, of magnesia, etc., *ad nauseam,* which have been poured down the poor patient's throat only to be promptly returned with interest.

This is not an overdrawn picture. I have seen it many times, but in the majority of the cases it must be said that the picture is an unnecessary one.

Let it be remembered that in every case of acute abdominal trouble an accurate history should be obtained and a most careful examination of the abdominal contents should be made at the earliest opportunity.

Do not forget that in strangulation of the bowel or other mechanical obstruction, or when the bowel is paralytic or spastically contracted, that cathartics of all kinds, however they may be administered, are almost always positively harmful.

Remember that the stomach and intestine in these conditions absorb very reluctantly or not at all anything put in them. They even secrete an increased amount of fluid which is forced back into the stomach and ejected by vomiting. The treatment in these cases is easily outlined.

Wash out the stomach with warm physiologic salt solution or dilute soda solution, and then keep it empty. Do not permit anything to enter it, not even water. The beneficial effect of gastric lavage in these cases was thoroughly demonstrated by Kussmaul years ago. Then empty the lower bowel by means of enemata so that the entire intestinal tract may be placed as nearly at rest as possible.

It is unnecessary to feed these patients for a time, for they never die of starvation, but they do need water, and this should be administered subcutaneously in the form of physiologic salt solution from 1,000 to 2,000 c.c. in the twenty-four hours. Such subcutaneous injections may be repeated any number of times by changing the location of the injection. It is to be understood, of course, that this treatment is but preliminary, and is to be supplemented by the proper operative measures at once in all cases in which a mechanical obstruction can be diagnosed or even found probable.

The treatment outlined places the patient in the best possible condition to undergo an operation, or in case an operation is deemed undesirable, it places him in the most favorable condition to aid nature in bringing about a cure.

It is not my intention at this time to enter into a description of the various operative procedures applicable to the numerous conditions above mentioned, for they are tolerably well defined, but I desire:

1. To enter a protest against the very common practice of indiscriminately administering cathartics in acute surgical affections of the abdomen.

2. To emphasize the diagnostic importance of a careful and thorough examination of the abdomen at the earliest possible opportunity.

3. To urge the importance of placing the entire intestinal tract at rest in the manner above described.

4. To operate at once on all cases of mechanical obstruction just as soon as the diagnosis can be made.

Special Article.

IMMUNITY.

CHAPTER V.

NATURAL IMMUNITY: (A) PROTECTION OF THE BODY SURFACES; (B) THE RÔLE OF INFLAMMATION.

(A) Virulent organism (e. g., staphylococci and streptococci) exist normally on the skin or between the superficial horny cells, some exceptional circumstance being necessary to enable them to penetrate deeper and to cause disease (wounds). It is evident, then, that the physiologic shedding of the superficial horny cells and their continual reformation at a deeper level is a process calculated to rid the surface of the body of many micro-organisms.

The Skin.

The question whether micro-organisms can ever penetrate the unbroken skin has been much discussed. Although experiments have shown that traumatism is not absolutely necessary, clinical experience indicates that these so-called cryptogenetic infections are not of ready occurrence. When they do occur, the infection atrium is probably one of the glandular orifices.

Soluble poisons such as aconite and bacterial toxins are not absorbed through the unbroken skin.

The sweat glands with their ducts, and the hair follicles with their appended sebaceous glands, are vulnerable points in the defense which the cutaneous surface represents. Although both these structures are somewhat protected by the flow of their excretions, especially in warm weather, and although the entrance of germs is made more difficult by the contraction of the skin and consequent narrowing of the orifices in cold weather, yet various incidents may lead to the introduction and retention of virulent micro-organisms in these structures. When this occurs there is little difficulty in the way of their producing necrosis of the epithelium and invasion of the surrounding tissue, causing a pustule, boil, carbuncle, cellulitis, or even a generalized infection. The secretion of the sebaceous glands appears to be not germicidal. On the other hand, the acid nature and certain salts found in perspiration render this fluid antagonistic to the development and virulence of some micro-organisms.

Cutaneous Orifices.

The serous exudate and the crust which forms subsequent to an abrasion antagonize infection. The serum itself contains germicidal substances, while the crust mechanically excludes microbic invasion.

Even after germs penetrate the epidermis, the subcutaneous connective tissue is often an obstacle to their further extension. The subcutaneous injection into animals of some micro-organisms (e. g., cholera) is tolerated better than one given into the abdominal cavity or blood circulation. We are also familiar with the benign course of lupus compared with visceral tuberculosis; the same is true of cutaneous and visceral glanders. These phenomena are explainable, at least in part, by the rapidity with which new connective tissue forms in this locality, offering a mechanical limitation to the infection, and by the rich lymph supply which makes possible the rapid accumulation of bactericidal lymph and of phagocytic cells. On the other hand, it must be mentioned that in some cases the subcutaneous tissue offers no perceptible resistance to bacterial invasion (plague), and that toxins may be more virulent when introduced into this tissue than when injected into the abdominal cavity or the general circulation (tetanus).

Subcutaneous Connective Tissue.

The moist condition of mucous membranes has been found to favor the multiplication of many microbes. Mucus is not in itself actively germicidal, but is said to attenuate the virulence of some micro-organisms, as the pneumococcus. A layer of mucus, however, is a mechanical protection, and its constant excretion is a means of steadily removing bacteria from mucous surfaces.

Mucous Membranes.

The conjunctiva is protected against infection by the mechanical interference of the eyebrows, eyelashes, eyelids, irrigation of the conjunctival surface by tears which carry germs through the lachrymal duct into the nasal cavity, the ability of the conjunctival epithelium to repair itself rapidly, and the mild germicidal action of the salts which are present in the tears. These protective agencies, however, are often surmounted by micro-organisms, such as the pneumococcus, staphylococcus and the influenza bacillus. Many soluble poisons, aconite, diphtheria toxin and the toxin of hay fever are readily absorbed from the conjunctiva.

Conjunctiva.

Compared with the anterior nares, the posterior are poor in micro-organisms. This is no doubt due to the filtering of the air by the hairs, the tortuosity of the channel causing dust and bacteria to strike the walls where they are held by a moist surface, and the action of the ciliated epithelium in carrying them imbedded in mucus again toward the anterior nares. Nevertheless, the nasal mucous membrane is a common infection atrium for streptococci, staphylococci, diphtheria and influenza bacilli, the virus of hay fever, and, probably, for other infectious agents.

Nasal Cavity.

At least thirty species of micro-organisms flourish in the oral cavity, some of them being pathogenic: staphylococci, streptococci, pneumococci, and often diphtheria bacilli. They are constantly removed with the saliva, and through the extensive desquamation of the epidermis occasioned by mastication. Saliva is not germicidal, but inhibits the growth and weakens the virulence of some bacteria. The fetid breath and the sordidity observed in fevers where the mouth is dry, at least in part, is attributable to the lack of saliva with its antiinfectious properties. The great rapidity with which wounds of the mouth heal is a potent factor in preventing serious infections.

Mouth.

Micro-organisms do not readily reach the ultimate ramifications of the bronchioles. In ordinary respiration the velocity of the inspired air is so reduced as it nears the alveoli that the further movements of the gases is one of gradual diffusion more than of violent admixture. Consequently there are greater opportunities for germs to come in contact with the bronchial walls where they become imbedded in mucus with which they may be expelled by coughing and the action of the ciliated epithelium. Both the alveolar epithelial cells and the leucocytes which enter the air sacs and bronchioles have been shown to take up bacteria. The conditions in the lungs which favor the development of infections, bronchitis, pneumonia, influenza, tuberculosis, etc., are by no means clearly understood. Variations in individual resistance, here as in other parts of the body, are certainly of great importance. It has been demonstrated that systemic infections, as with anthrax bacilli, may be caused by the inhalation of the germs; and it is probable that the lung is the infection atrium for a number of our acute infectious diseases.

Lungs.

The gastric juice, through the hydrochloric acid it contains, is able to kill anthrax, typhoid, tubercle bacilli, cholera vibrio and other organisms. Clinical and experimental evidence shows that this power is often inadequate, virulent micro-organisms reaching the intestines in spite of it (typhoid, cholera, dysentery, tuberculosis, etc.). It is probable that bacteria in the stomach are often protected against the action of the gastric juice to some extent by being imbedded in solid particles of food. Certain acidiphilic germs, as well as yeasts and torulæ seem to flourish in the gastric secretions; these are largely non-pathogenic, but the regularity with which peritonitis follows perforating wounds of the stomach indicates that it probably always contains pathogenic bacteria, though it may be only their temporary habitat. The gastric juice may render some bacteria harmless by digesting their toxins; one

Stomach.

gram of the gastric juice of a dog will neutralize fifty fatal doses of diphtheria toxin, or 10,000 of tetanus toxin, using the guinea-pig as the test animal. On the other hand, the toxin of the bacillus of botulism (causing a form of meat poisoning) seems to be uninfluenced by the stomach contents, as the development of the intoxication indicates. Vomiting is often a means of ridding the stomach of toxic substances, including bacteria. The stomach itself is exceptionally free from infections.

Intestines.

The bile is moderately bactericidal for some germs, but on the whole the intestinal secretions have low germicidal powers; this is indicated by the fact that the colon contains many more bacteria than the duodenum, great proliferation having occurred. On the other hand, the pancreatic juice destroys some toxins (diphtheria, tetanus) more powerfully than the gastric juice. This ability of the pancreatic juice to destroy toxic bacterial products may explain why enteritis is more frequently found in the ileum than in the duodenum. The bile also has a neutralizing power for some toxins. Although a number of pathogenic bacteria inhabit the intestinal tract, colon bacillus, streptococci, etc., in the adult they do not often set up inflammatory processes nor penetrate the mucosa to set up recognizable changes. The tissues become accustomed to their presence. The pathogenic bacteria which do not normally exist in the intestines are those which, on introduction, cause disease (typhoid, cholera, dysentery, etc.). The intestinal tract of the infant, on the other hand, is frequently inflamed by some micro-organisms (streptococcus, colon bacillus, bacillus pyocyaneus), which in the same locality in the adult appear harmless. The fact that many individuals are not stricken in an epidemic, where all are equally exposed to infection, indicates that such pathogenic organisms as those of typhoid, cholera and dysentery often traverse the intestinal canal without inducing disease. Naturally, microbes are eliminated in enormous quantities in the feces, and in inflammatory states this elimination is increased by diarrhea. It is also not to be forgotten that the intestinal tract is to a considerable extent a lymphoid organ, and that consequently in the presence of infection enormous quantities of phagocytes can quickly be called into action.

The protective properties of the genito-urinary surfaces are not different in principle from those already mentioned, for example, vaginal acidity, urinary irrigation.

(B) Although there are many chemical and physical causes of inflammation, we are interested here only in those of infectious etiology.

Nature of Inflammation.

We are to look on inflammation as a reactive process on the part of the tissues, which is induced by some injurious agent. The process may be beneficial in some instances, while in others it may be pernicious from the beginning to the end. The thickening of the endothelium of the cerebral vessels as one sees it in syphilis, for example, is a progressive, reactive change which in no sense can be of benefit to the individual, and which can have no conceivable function in overcoming the syphilitic infection. Likewise, the new formed connective tissue seen in alcoholic cirrhosis of the liver is of no benefit to the hepatic tissue, though it may serve in some degree to protect the liver cells from the alcohol which continues to be ingested. In an ulcer of the cornea the presence of serum and of leucocytes, as well as the proliferation of connective tissue, may be the *sine qua non* for the healing of the ulcer, yet the resulting scar may greatly impair the vision. On the other hand, an extensive scar which has formed in the skin and subcutaneous tissue as the result of a wound or an infection, may be harmless because of its situation.

It is then to be recognized that there are certain consequences of the inflammatory reaction, the seriousness of which depends on the situation, severity, duration and extent of the process, and that these consequences are independent of any protective function the inflammation may have exercised previously.

Variations in the Reaction.

The amount and character of the reaction are subject to many variations, depending on a number of conditions:

1. It varies with the nature of the microbe. Non-pathogenic organisms induce little more inflammation than so many minute, inanimate, non-toxic particles. The tubercle bacillus causes especially the formation of connective tissue, giant cells and the accumulation of lymphoid cells, aside from some retrogressive changes characteristic of the disease. The streptococcus, pneumococcus, etc., induce the formation of pus, fibrin, the accumulation of serum and of polymorphonuclear leucocytes more than mononuclears; while proliferation of fixed tissue elements is secondary. The tetanus bacillus alone causes almost no local inflammatory change.

2. The reaction is influenced by the virulence of a particular bacterium. A streptococcus which has lost its virulence is disposed of by the animal tissues with a minimum tissue reaction, perhaps no more than slight congestion and the wandering in of a few leucocytes; one of average virulence causes an intense reaction, manifested by congestion, edema, hemorrhages, necrosis and pus formation; then streptococci with such great virulence are occasionally encountered that they destroy life in the course of a few hours, having elicited barely perceptible inflammatory changes (seen sometimes in wound infections and peritonitis).

3. It has a relation to the resistance of the individual. Metchnikoff, in particular, has shown that animals of high resistance to a particular microbe destroy the germ quickly by phagocytosis (the ingestion of particles by cells, especially the leucocytes), while in susceptible animals the accumulation of phagocytic leucocytes is deficient.

The features of inflammation to which we attribute a protective effect in infections, on the one hand, are those of a progressive nature, as the proliferation of connective tissue, blood and lymph vessels, epithelium and lymphoid tissue; and, on the other hand, some conditions which are not essentially progressive, but which may be valuable adjuvants both in the formation of new tissue and in antagonizing the injurious agent, as accumulations of plasma or serum, fibrin and leucocytes.

Leucocytes.

The function of the leucocytes and lymphocytes in an infectious inflammation is one of the most interesting and problematic in pathology. It is a long known fact that some microbes attract one kind of leucocyte, while others attract another kind. Thus, in tuberculosis one finds lymphocytes and plasma cells—mononuclears—predominating greatly over the polymorphonuclears. In the acute purulent infections, on the other hand—streptococcus, staphylococcus, pneumococcus—the latter type of leucocyte predominates, while the mononuclears are fewer and tend to remain at a respectful distance from the center of action. Then, again, the aggregate of leucocytes attracted by a given micro-organism varies a great deal in different cases; this probably depends on variations both in the properties of the microbe and of the cells of the individual.

Chemiotaxis.

This phenomenon of living cells moving toward or away from certain other cells or substances is termed chemiotaxis: the former is positive, the latter negative, chemiotaxis. There is a somewhat general law, but one to which well-marked exceptions exist, that, regardless of the microbe involved, the more acute the inflammatory process the more do polymorphonuclear leucocytes accumulate, while in the more chronic infections, with much connective tissue formation, the mononuclear leucocytes predominate; and there is reason to believe that the latter cells play an important, though perhaps indirect, rôle in the formation of the connective tissue.

Phagocytosis.

The ingestion of particles by living cells, phagocytosis, is a property which many cells possess. Although micro-organisms and inanimate particles are sometimes found in epithelial cells, certain of the mesoblastic cells have this function pre-eminently: Polymorphonuclear leucocytes, large mononuclear leuco-

cytes (lymphocytes), connective tissue and endothelial cells, named in order of importance. Of these the polymorphonuclear leucocytes, the microphages of Metchnikoff, have the greatest phagocytic power; the others, the macrophages, are more exceptionally phagocytic. Now, the mere ingestion of the bacteria by such cells would not be of necessity injurious to the microbes; indeed, opponents of Metchnikoff's phagocytic theory of immunity hold that phagocytosis by wandering cells may be, and often is, pernicious, as the cells may return to the circulation and spread the infection to other parts. But when we learn that after ingesting the bacteria the phagocytes are often able to kill and digest them, it is realized that the process may be a very salutary one. It is also represented that such cells have the power of excreting their germicidal substances into the plasma and serum and lending to the latter a bactericidal power. Furthermore, it is held that they may absorb liquid poisons, bacterial toxins, and by a similar process destroy their toxicity. Granting these points, which are essential tenets of the phagocytic theory of immunity, the importance of positive chemiotaxis in the recovery from an infection becomes manifest.

Influence of Plasma and Serum.

Serum, even when entirely free of leucocytes, has bactericidal powers; it need not be discussed at present whether this power exists primarily in the serum or is one conferred on it by the leucocytes. In view of its presence, however, it is evident that the serous exudate which is usually present in inflammations, especially the acute, may be of influence in combating the infection. Serum also contains natural antitoxins, and, in addition, it may be of value in lessening the toxicity of poisons by diluting them and by washing them away.

Fibrin.

The abundant deposit of fibrin in some inflammations is of mechanical value in hemming in the infection and in offering a barrier to the rapid diffusion of toxins. We are all familiar with the part played by fibrinous and fibrous adhesions in preventing a localized peritonitis from becoming generalized. In prolonged inflammations fibrin furnishes a ground substance into which new connective tissue and vessels grow (organization).

Inflammatory Connective Tissue.

The new formed connective tissue seen in many inflammations, especially the chronic, as in tuberculosis and actinomycosis, offers an important barrier to the extension of an infection. Perhaps no better example of this could be cited than the dense tissue which forms around a tuberculous sinus or abscess.

To sum up: An inflammatory reaction antagonizes an infectious process, mechanically, through the presence of fibrin, leucocytes and new formed connective tissue, chemically, or physicochemically, through local antitoxic and bactericidal agencies contained in the fluid and cells—phagocytes.

The value of hot applications in local inflammations, in that they increase congestion, which hastens the exudation of plasma and leucocytes and the proliferation of cells, finds a logical explanation in view of the facts mentioned. Also increase in local temperature probably favors chemical actions.

There are many details in reference to the part played by phagocytic cells in inflammation and immunity which it is impossible to consider here. Adami's[1] classic article on inflammation treats of many of these details in an admirable manner.

(To be continued.)

1. Allbutt's System of Medicine, vol. I.

The Training of the Surgeon.—Dr. Senn, in the *Monthly Cyclopedia of Practical Medicine*, sums up the training of a surgeon as follows: Master the elementary branches in college, do general practice for several years, return to laboratory work and surgical anatomy, attend the clinics of different operators, and never cease to be a physician. If this advice is followed there will be less unnecessary operating done in the future than has been the case in the past.

Clinical Report.

A CASE OF ARTHRITIS DEFORMANS IN WHICH LARGE DOSES OF ARSENIC WERE TAKEN.*

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Patient.—A. M., aged 24, single, farmer, American; was admitted to the medical clinic of the University Hospital, Oct. 29, 1901. Patient complained of dull, heavy pain, stiffness and deformity of many joints. Family history negative. Previous history negative. Diphtheria at 6, measles at 15. Denies venereal disease.

History.—The present disease began six years ago with a dull, heavy pain, swelling and grating on movement of the left knee. The same condition manifested itself in the left hip, left elbow and wrist, in rapid succession. Two years ago, the temporo-maxillary joints became stiff, with a click on movement and much swelling over the glenoid fossæ. At the same time there was stiffness of the neck; soreness, and pain on swallowing, in the region of the thyroid cartilage and hyoid bone. At the articulations of the costal cartilages with the sternum there was soreness and a dull ache, which became aggravated on deep breathing.

The right hand, elbow, hip, knee and ankle were attacked in the same manner one year later. The feet were the seat of a burning sensation, became swollen and sore and stiff, especially in the region of the tendo Achillis. The swelling in the various joints was not constant. There was much twitching of the muscles of the lower extremities, more pronounced before a storm.

About two years after the appearance of the joint condition, the skin gradually became pigmented. The color was a yellowish brown and diffuse, more marked over the shoulders, nipples, back, buttocks and genitals. Often there was a feeling of uncomfortable warmth about the upper part of the body, followed by perspiration or coldness. All the symptoms have gradually progressed up to the present time except the swelling.

Examination.—The patient limps about with the aid of crutches; removes his clothes with difficulty, and is unable to raise the lower extremities on lying down. His frame is slightly above medium size. There is considerable atrophy of all the muscles of both upper extremities, especially on the left side. The left thigh and leg muscles show moderate atrophy. There is much pain and tenderness in all the muscles.

The temporo-maxillary joint is weak and stiff and gives a click on motion. The shoulders are normal. The left elbow is partially ankylosed, allowing 5° motion; all the tissues are thickened. The right elbow is normal except for a slight grating. The left wrist is slightly enlarged and ankylosed, permitting a movement of 3°. The right wrist is swollen, red and tender, allowing only 5° of motion. The left hand has fusiform bony enlargements of the second phalangeal joints of the index and middle fingers. The metacarpal-phalangeal joints of the little finger present an elastic swelling and stiffness. All the joints of the right hand show enlargement and stiffness. The metacarpal-phalangeal joints of the first and second fingers show fusiform elastic enlargement, suggestive of fluid.

Both hips are partially ankylosed, sore and painful on movement. The left knee is stiffened, but not enlarged; the loss of movement is apparently due to contraction of the thigh muscles. The right knee is normal. The feet give grating on movement. The entire spinal column allows free motion.

*From the Medical Clinic of Dr. Dock.

The thorax is normal. Heart and lungs, normal. Radial pulse, 80 a minute. Temperature, 99 F. Abdomen, normal; bowels, regular. Examination of the stomach contents shows normal condition. The blood count, 4,480,000 red cells, 8,912 leucocytes per c.mm.; hemoglobin, 80 per cent. Five m.g. Koch's tuberculin gave no reaction.

Diagnosis.—From the history of the insidious onset of the disease, the pain, the symmetrical involvements of the joints and of all the structures, the destructive changes therein, the twitching, tenderness and atrophy of the muscles, the pigmentation, the sensation of heat and coldness, the unnatural sweating and the absence of specific or tuberculous disease, a diagnosis of arthritis deformans was made.

Treatment.—The treatment consisted of rest in bed, with oil of gaultheria over the joints. Internally, small doses of salol and phenacetin were given for the muscular pain. Liquor potassi arsenitis was ordered in increasing doses.

Result.—While under observation, the swelling and soreness of the hands improved; the pain and tenderness of the muscles decreased. The temperature ran an irregular course between 97.4 and 100.2 F. The pulse ranged between 72 and 112. The patient was discharged Nov. 17, 1901, with instructions to continue the treatment which he had been receiving.

Subsequent History.—He returned to the hospital Oct. 2, 1903, and stated that after leaving here he remained in bed the following winter, applying passive exercise to the joints; massage to the muscles; vapor baths for the acute attacks of pain, and medication as above. Improvement was gradual except in the right hip; the effusion in the joints disappeared; the ankyloses improved, but he still complained of the heavy pain in the joints, twitching of the muscles and of general stiffness, especially before storms. Improvement continued up to the spring of 1903, when the patient was able to walk with the aid of a cane.

During all this time the pigment over the body increased, mostly on back, axilla, buttocks, nipples and genital region. During the first three months of medication the pigmentation increased most rapidly. This was especially noticeable as the dose of Fowler's solution was between 10 and 16 drops t. i. d. Dosage above 16 drops t. i. d. could not be borne without swelling of lids, suffusion of the conjunctiva, nausea, and a tendency to diarrhea. Some months later, the skin of the palms of the hands and soles of the feet became thickened. Later, the openings of the sudoriparous glands of palms of hands, shoulders and soles of the feet became reddened, enlarged and protruded above the surface.

Weather seemed to have a marked influence on the disease. Clear, cold winter or hot, dry summer weather was most comfortable. Two or three days before a southern or eastern storm there would be much pain in the upper part of the body, accompanied by a diffuse erythema and followed by a branny desquamation. The latter condition was also seen to a less extent when the dose of Fowler's solution was the highest.

Later, there was an eruption on the scrotum, described as beginning with redness and blisters of small size, which became scaly and painful. This has entirely disappeared. At the present time there is still some pain in the joints; more severe in the right hip, thigh and knee. The patient is well nourished. Musculature moderately developed, more on left than on right, although the cane is used in right hand. The skin is elastic over the upper part of body, arms and thighs. The face has a rather swarthy appearance, unlike that of tan. Over the right eye, there is a shiny, brownish, irregular area about 2 by 2.5 c.m, of diffuse pigmentation, with small areas of varying size at the periphery, giving the appearance of a splash of stain. The conjunctivæ are suffused and the under lids puffy. The skin of the body is more deeply pigmented than the face, this being especially true of areas normally pigmented. The color resembles that of a mulatto. On the upper part of the arms, shoulders, back and buttock there is a stippling produced by numerous small white circular spots from 1 to 3 m.m. in diameter with no deeper ring of pigment around them, giving the appearance of the pigment having been washed out by individual drops of water.

The dorsal surfaces of the hands are unpigmented; the skin is abnormally thin and shiny; there is no hair on the radial sides.

Over the thigh there is a deep bronze pigmentation, more marked just above the knees. The inner surfaces of the legs show a lighter diffuse pigmentation with several small, round, deeply pigmented spots the size of freckles. The outer surfaces are less pigmented; the skin is thin, glossy, with no hair, giving the appearance found on the hands.

The feet have a pinkish blue color, the soles and also the palms of the hands are thickened and rough, resembling ichthyosis. On the shoulders there are red papular eruptions caused by the inflamed orifices of the sudoriparous ducts. On the balls and heels of the feet are numerous hornlike elevations 2 m.m. wide and 3 m.m. high, caused apparently by hypertrophy around the orifices of the ducts. There is unusual sweating on hands and feet. There is a slight transverse notching of all the nails.

The temporo-maxillary and shoulder joints are normal except for a slight grating. The left elbow presents slight bony enlargement with movement of 70°; about one-half supination and pronation is possible. The right elbow gives grating on movement. Both wrists show enlargement of the styloid processes of the radii, and allow 25° movement. The left hand shows stiffness and enlargement of all the phalangeal joints. The little finger shows marked shortening of the proximal phalangeal bone. The first finger shows bony enlargement of the metacarpal-phalangeal joint. There is partial ankylosis of the sacroiliac joint. The left iliac bone is higher and protrudes more forward than on the right. The thighs can be flexed to a right angle with the body; the flexing causes a pushing of the pelvis backward so that the hand can not be placed under the back. The left femur is 1½ inches shorter than the right. The knees are not altered in shape; the limitation of movement in the right is due apparently to spasm of the thigh muscles. The feet are normal, except for slight enlargements of the metatarsal-phalangeal joints of the great toes.

The thorax is normal in shape; lungs and heart, normal. No palpable sclerosis of the vessels; pulse, 72; temperature, 99.

There is severe neuritis of both anterior crural and inguinal nerves; less severe in the circumflex and sciatics. The tendon reflexes are slightly exaggerated at the knees. All sensory tests give normal result. The urine is normal. The blood shows improvement over condition when first observed, giving 5,080,000 red cells; 8,657 white cells to c.mm.; Hb. 90 to 100 per cent.

In summing up this case there are some interesting points to be noted. The treatment consisted principally of the continued use of liquor potassii arsenitis for a period of nearly two years. At no time could a dose above 16 drops t. i. d. be borne without showing symptoms of acute arsenical intoxication, such as suffusion of the conjunctiva, puffiness of the lids, nausea and a tendency to diarrhea. This would indicate that in this case no tolerance was produced, as is usually the rule in the internal administration of arsenic. In all, 27 fluid ounces of Fowler's solution have been taken, which represents about 130 grains of arsenious acid in two years, or an average of 1/6 grain daily, only enough, according to authorities, to cause the mildest signs of chronic intoxication.

The general improvement of arthritis deformans for such a length of time is of interest. The morbid processes in and around the joints have largely disappeared; the pain and movements are much improved, even in those joints where destructive change was produced as shown by the shortening of the bones and grating. It has been mentioned before that the right hip has not shown the improvement of the other joints. Such improvement may be due to treatment, of may be spontaneous. No doubt, a part was accomplished by treatment.

The muscular system as a whole shows improvement. There is less twitching, pain and atrophy. The atrophy remains most marked on the right side, although these muscles are exercised, especially in the upper extremity, by using a cane.

Of the remaining changes which should be mentioned part are entirely due to disease, part to the arsenic, and part probably to both. There is a slight neuritis of both the circumflex and sciatics, more marked in the inguinals and anterior crurals. The question arises whether or not this neuritis is of arsenical nature. A definite answer is impossible, but it seems to be no more severe than is present in many cases of arthritis deformans.

The patellar tendon reflexes are slightly exaggerated, as might easily arise from the neuritis present, or result from the arsenic, as such a condition is found in mild forms of this intoxication and in the earlier stages of the severer forms preceding paralysis. The normal condition of the sensory nerves shows that there has been no effect on their powers of transmission. However, cases in the recent Manchester, England, epidemic were found in which there was paralysis of the muscles and normal sensation.

The burning sensations of the skin on the feet are commonly found in both conditions, but as it was present before the treatment was instituted it is fair to assume that a large part at least is due to the disease.

The changes in the skin are the most difficult to interpret. The presence of the patch of pigmentation over the right eye, which the patient says is a "birth-mark," is of interest, as such patches on the forehead or temples form one of the earliest signs of arthritis deformans.

The diffuse pigmentation was present in part before any medication, and is a very common sign of the disease. The marked increase during the first months of medication was no doubt due to the arsenic. It might be well to call attention here to the fact that a temporary increase of this pigment appeared just previous to oncoming storms from the south or east, and that the pigment was most pronounced in the regions of the body having the most pain (usually the thorax). This pigmentation was always accompanied by a diffuse erythema and followed by a branny desquamation. These conditions may have been due to a change in the vasomotor system allowing increased blood supply and apparently a darker color and desquamation; or the desquamation may have resulted from the effects of the arsenic, as such is common with or without erythema.

The atrophic condition of the skin on the dorsum of the hands and outer surfaces of the legs is no doubt due to the effects of the disease, although in one stage of arsenical intoxication these changes are present.

The small, more darkly pigmented spots on the inner surfaces of the legs have been reported in both conditions. The stippling of the skin over the shoulders and buttocks is due to the effect of the arsenic producing atrophic changes. Many of the cases in the Manchester epidemic showed similar marking. Nothing of the kind has been reported in connection with arthritis deformans; however, larger irregular patches of absence of pigment gradually shading into pigmented parts are seen in improved cases.

The general thickening of the epithelial layer of the palms of hands and soles of feet is present in both conditions. No doubt this has been influenced by arsenic as it has increased in the past two years, producing an appearance of ichthyosis. The unnatural perspiration is equally common in both.

The redness and hypertrophy of the sudoriparous glands of the palms of the hands, back of shoulders and soles of the feet, with a condition resembling corneal horns on the heels and on the balls of the toes, is due entirely to the stimulative action of the arsenic.

The eczematous condition which appeared on the scrotum is common in affection of the skin by arsenic, as is also the puffiness of the lids, suffusion of the conjunctivæ, and the irritability of the alimentary canal.

The notching of the nails may have resulted from disturbance in nutrition in either case.

In the recent English epidemic arsenious acid is reported to have caused enlargement and tenderness of the metacarpal joints. This explanation could not be applied here, as these joints were all affected before and it is only of interest in showing the marked likeness in these two conditions.

Surgical Spinal Analgesia in Mexico.—Mexican surgeons long ago adopted this method of anesthesia, and Villareal, Urrutia and others use it frequently for operations on the legs, genital organs and urinary passages, as well as for various gynecologic and abdominal operations and in obstetrics. A recent thesis on the subject by J. Adalid y Castillo is published in the *Revista Medica*, vol. xv, No. 21, Nov. 15, 1904, with numerous illustrations. He mentions several minor technical points worth noting. If the needle is inserted with the bevel held horizontally the fibers of the dura mater, being longitudinal, are severed and a much larger hole results than when the bevel is held vertically. Another point is to caution the patient not to make the slightest movement while the needle is in place. If he bends his trunk in any direction the fibers of the dura mater are lacerated and the hole enlarged. The Mexican surgeons consider it important to leave the needle in place for ten or fifteen minutes. This plugs the hole made in the dura mater, and prevents the escape of th anesthetic fluid into the surrounding tissues, which mishap is responsible for the accidents observed. A stopcock in the nozzle of the syringe prevents any reflux of the fluid, and also allows the body of the syringe to be detached and removed as soon as the needle is in place. They know of no contraindications to spinal analgesia for subjects over 12, except the disadvantage of having certain patients witness or be conscious of the procedures.

Pernicious Anemia.—From an elaborate study of the subject and of the theories advanced by various authorities Syllaba offers the following explanation of this disorder. His communication appeared in the *Archives Gén. de Méd.*, cxciv, No. 38, 1904. There are certain toxemias the first and immediate effect of which is an abundant destruction of the red corpuscles occurring in part in the general circulation, and in part, perhaps, in certain organs. This hemocytolysis as such incites the hemopoietic organs to a powerful reaction and a deadly war occurs between the exaggerated hemolytic and the reinforced hemopoietic processes. If the toxic agent is the least active the destruction of red corpuscles is less intense and the hemopoietic organs are sufficient to restore the destroyed elements. This is what occurs in bronzed diabetes and in similar conditions. There is here no grave anemia, but sometimes a slight plethora and the chief, if not the only, proof of the exaggerated hemolysis is the pigmentation. If the toxic agent is more active the destruction of the reds is also more intense, and hemopoiesis, even when stimulated, is insufficient to repair the damage. There results a grave anemia as the principal symptom of the syndrome of Biermer. The relationship of this syndrome with bronzed diabetes and similar conditions is proved by the analogies which exist in the visceral pigmentations. Moreover, although the hemolysis always prevails in Biermer's disease, there are nevertheless from time to time, periods in which the hemopoietic activity appears to prevail temporarily. This occurs especially after marked exacerbations of the hemolytic process, during which also the irritation of the hemopoietic organs, caused by products of the destruction of the corpuscles, attains its highest degree. With arsenical treatment we imitate the natural process. We artificially increase the destruction of red corpuscles, already rather intense, so as to stimulate the hemopoietic organs into a salutary reaction. He compares these processes with those occurring in the overtaxed heart, its compensatory hypertrophy, and the stimulation of respiratory activity by obstruction of the air passages. Each pathologic process like that in the blood-producing organs excites a compensatory stimulation to save the organism. The automatic regulation of the composition of the blood by way of hemocytolysis is, therefore, a tetelogic phenomenon of the first order.

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PHYSIOLOGY OF UTERINE CONTRACTIONS.

Our readers are probably familiar with the observations of the Russian physiologists on the possibility of "revival" of the activity of the mammalian heart, by transfusion through its vessels of nutrient saline solutions even after astonishingly long periods of quiescence or "death." These experiments formed the basis for most remarkable newspaper articles on "resurrection of the dead," at the time of their publication.

In Pawlow's laboratory experiments of similar nature on the uterus have recently yielded interesting if less sensational results.[1] By removing the uterus and its adnexa, together with the broad and round ligaments, the cellular tissues, and a piece of the aorta and vena cava of rabbits, after having previously washed out all the blood with a saline solution (Locke's), it is possible to secure the organ in a condition for study independently of the action of the central nervous system. When such a uterus is kept in a specially prepared moist chamber apparently normal contractions take place independently of any external stimuli; a short period of rest follows each period of contraction, and so on alternately for an hour or more. This automatic contractility is observable in the virgin uterus, as well as in multiparous animals, but the sensitiveness of the uterus is greater and its action more vigorous and prolonged in pregnancy. Furthermore, in organs removed toward the end of pregnancy the entire birth mechanism can be observed to occur in all its details, independently of the central nervous system. The vagina contracts independently of the uterus, and the broad and round ligaments appear to take an active part in uterine contractions, particularly in parturition. After excision of such a uterus it could be "revived," i. e., made to resume contractions, even after from twenty-four to forty-eight hours, if kept in a cool vessel of saline solution. This merely means that the uterine muscle cell does not lose its power of contractility when kept without nourishment for this length of time, provided that disintegration, which probably is a result of autolysis of the cells, is prevented by keeping it at a low temperature at which the ferments are inactive.

Pharmacologic observations on such isolated uteri show conclusively that the action of such drugs as ergot is entirely local and not through nervous influences. Sphacelinic acid causes exactly similar changes in the isolated organ as it does in the uterus of the intact animal, as shown by tracings of the contractions, but it has no effect on the blood vessels of the isolated organ. Hydrastinin produces exactly similar results. Adrenalin, even in the most dilute solutions, acts more energetically on the uterus, whether isolated or intact, than those remedies which are usually regarded as specific for that organ, according to Kurdinowski, while it energetically constricts the blood vessels even of the isolated uterus. Narcotic poisons, such as chloral hydrate and alcohol, have relatively little influence on the isolated uterus. As the phenomena observed in these experiments on the uterus are also seen in smooth-muscled organs generally, the degree of independence of smooth-muscle tissue from outside nervous influences seems well established.

1. A summary of this work by Kurdinowski in English will be found in the Dublin Journal of Medical Sciences, December, 1904. Also in THE JOURNAL, xliii, page 1586.

ZOMOTHERAPY IN TUBERCULOSIS.

About four years ago, Richet published his observations on tuberculous dogs which had been fed on large quantities of raw meat or raw meat juice. He concluded that the disease can be arrested, in the great majority of instances, if a sufficient quantity of meat is given and hazarded the opinion that, in all probability, a similar method of treatment would be of value in human beings. A few months later, Héricourt published his observations on twenty-five cases of human tuberculosis. He showed that in the first two stages of the disease, the treatment is often of great benefit, but suggested that it should be used with caution in the third stage, especially when there is evidence that the liver is performing its work imperfectly.

Recently Philip[1] has published the results of his experience with this form of treatment, together with the results of some work on the effect of zomotherapy on metabolism which was done by Galbraith under his direction. Galbraith's observations were made on healthy and on tuberculous patients, in whom the nitrogenous value of the food was maintained as nearly constant as possible throughout. The experiments showed that under raw meat feeding there was a marked increase in nitrogen retention, provided that the heat value of the nitrogen in the diet exceeded the actual requirements of the individual per kilo of body weight. They also showed improved intestinal metabolism and a marked digestive leucocytosis. These results were probably not from overfeeding *per se,* for if this were the case cooked meat should have had the same effect. Philip thinks that there is probably some enzyme in the raw meat which is destroyed by heating, and that this explains the difference in action between raw and cooked meat.

The results obtained by Philip were encouraging, even, in some cases, in the third stage of the disease;

1. Practitioner, January, 1905. Abstracted at length in THE JOURNAL, p. 663, No. 17.

but the best results were obtained in the earlier stages. The patients almost without exception improved in general appearance, there was a gain in weight of from 10 to 30 pounds, and the new-formed tissue was firm and not largely in the form of fat, as is the case with some other forms of overfeeding. There was an increase in muscularity, and at the same time a decrease in the myotatic irritability which is so commonly present in tuberculosis. The pulse rate generally slowed and the blood pressure increased, while the blood itself showed a great increase in hemoglobin and a more marked digestion leucocytosis. The temperature was favorably influenced, the digestive processes proceeded with greater ease. and the local signs regressed, and in some cases disappeared.

Some recent work of Richet[2] throws some light on the philosophy of this form of superalimentation. By means of experiments on dogs he shows that the amount of nitrogenous material required in the food during the first stages of tuberculosis is from 25 to 100 per cent. more than is required by the normal individual. If there is a loss of weight this shows that the calories excreted are greater than those taken; if there is a gain in weight the contrary is the case. In dogs with tuberculosis. two dietary considerations are necessary, food enough to produce at least 12 calories per cubic decimeter of surface, and at least 15 centigrams of nitrogen per cubic decimeter of surface. It is probable that similar dietary considerations are necessary in tuberculous human beings.

THE VALUE OF SUSPENSION OF DEAD TYPHOID BACILLI FOR THE WIDAL REACTION.

The reliance which the profession in general places on the Widal reaction is shown by the fact that in many states the country practitioner is able to have blood from suspected cases tested by a state laboratory, and frequently avails himself of this opportunity. In many large cities a similar condition exists. In the case of the country practitioner, the distance from the laboratory frequently entails a considerable loss of time before a report is received. It is obvious, too, that under certain other conditions, such as those which prevail on shipboard, or with an army in the field, the ordinary method of making the Widal test will not avail. It will be remembered that in the early history of the Widal reaction it was proposed to make the test a macroscopic one, but this form of the reaction. though perfectly feasible, was subsequently abandoned because the microscopic test was found to be more delicate. It was further noted by Widal himself that in cultures of the typhoid bacillus killed with formalin. clumping took place with typhoid sera almost as well as if living cultures were used. These facts were not put to practical use until late in 1903, when Ficker proposed the use of dead cultures, and the macroscopic instead of the microscopic method, when the circumstances prevented the use of living cultures. The fluid containing the suspension of dead typhoid bacilli Ficker called the diagnosticum, and since he published his original article a number of reports bearing on the value of the procedure have been published.

The important questions to be determined are whether the diagnosticum is to be compared in accuracy with the ordinary method of performing the Widal reaction, whether the procedure is simple enough and the results obvious enough to be available to one without a special laboratory training, and whether the test fluid will keep for a reasonable length of time under varying climatic conditions. These queries have recently been answered in three articles by Selter, Flatau and Wilke, and Eichler.[1] The studies of Selter, and those of Flatau and Wilke, had to do, for the most part, with the determination of the reliability of the test. The studies of Selter were conducted during a small typhoid epidemic. during which he was able to obtain blood from cases in various stages of the disease. He came to the conclusion that the use of the diagnosticum was as satisfactory as the ordinary Widal reaction during the height of the disease, but was not so reliable early in the disease and during convalescence. He states that he considers the diagnosticum to be a valuable aid to our methods of diagnosis in typhoid fever, but that some writers go too far when they state that it will take the place of the Widal reaction, as it does not appear till later and disappears earlier. Flatau and Wilke give a more favorable account of the value of the diagnosticum. In their series of cases it gave a positive result on every occasion that the Widal reaction gave a positive result. It also gave a good reaction in some cases as long as nine years after the attack of typhoid. The researches of Eichler bearing on the keeping properties of the solution, especially in tropical countries, showed that the fluid was good for as long as nine months.

The net result of these observations—and preceding ones agree with them in the main—is to show that dead cultures of the typhoid bacillus used in conjunction with the naked-eye method of observation, are of great practical value in the diagnosis of typhoid fever. Inasmuch as the use of this method requires neither a microscope nor an incubator, and does not necessitate the keeping on hand of a fresh typhoid culture, it might be of great value in remote country districts, on shipboard and in the field.

TRUTH AND POETRY CONCERNING URIC ACID.

VII.

Thus far in the discussion of uric-acid formation we have gone on the general assumption that uric-acid excretion is an index therefor. We have followed this plan in order not to make the discussion too complex.

2. Revue de Médecine, vol. xxv, No. 1.

1. Münchener med. Woch., No. 3, 1905.

but it must now be pointed out that uric-acid formation and uric-acid excretion do not always go on parallel to each other. Uric-acid excretion depends not on uric-acid formation alone, but probably on two other conditions: First, on retention due to the difficult solubility of the substance; second, on the decomposition of uric acid, once it has been formed inside the body.

While uric acid is a difficult soluble substance and is easily precipitated from solution, under normal circumstances the factor of retention from this cause probably influences uric-acid excretion very little. Haig, it is true, in order to bolster up his theoretical conceptions when the facts contradicted them, has made a great point of uric-acid retention. He brings forward no convincing evidence in favor of his view, and other investigators do not support him. In disease, on the other hand, there may be marked retention of uric acid and precipitation in the tissues; under these conditions it would be fallacious to suppose that the amount of uric acid excreted is an index to the amount formed. The literature on gout shows how prone physicians are to fall into this error, and the conflicting theories of gout have largely arisen as a result.

Much more important under normal conditions is the fact that a certain amount of uric acid is destroyed in the body after it is formed. We have known for more than fifty years[1] that most of the uric acid fed as such is transformed in the body to urea, and recently this fact has been established beyond doubt.[2] Different animals behave somewhat differently in this regard, dogs converting more of the uric acid to urea than rabbits.[3] Newborn dogs, on the other hand, do not decompose the uric acid to any extent.

Since uric acid introduced as such is largely destroyed in the organism, it was natural, reasoning by analogy, to think that uric acid formed as an intermediary product of metabolism in the body, should undergo a similar decomposition. Many researches have been made to test this point, with conflicting results, Loewi denying such a decomposition, Burian and Schur maintaining it. So far as we can judge, the latter investigators are right. One experiment of theirs makes their idea very probable. On injection of a given amount of uric acid into an animal, the same amount of uric acid is excreted in the urine as when equivalent amounts of purin bases are given to the same animal, either subcutaneously or by the mouth. The most plausible explanation seems to be that all the purin bases are converted into uric acid, and that a part of this is destroyed just as when uric acid itself is administered.

According to Burian and Schur, it is possible to calculate from the uric acid excreted in twenty-four hours, the amount which has been formed during this time. Their rule is to multiply the amount excreted by a fraction whose numerator is 100 and whose denominator is that percentage of the purin nitrogen taken in which is given out as uric-acid nitrogen. Reducing this fraction we obtain the so-called integrative factor; in the dog it is 22; in the rabbit, 6; in man, 2.

Besides having proved the decomposition of uric acid of exogenous origin in this way, Burian and Schur believe that they have shown that a similar fate awaits the purin of the uric acid of endogenous origin. Thus the blood of dogs on a purin-free diet, after extirpation of the kidneys, contains no uric acid. This might mean either that the kidneys form uric acid, or that the uric acid in the blood is in a combined state, or that under the conditions mentioned the uric acid formed is destroyed. Now, on excluding the liver from the circulation in such animals, uric acid appears in the blood at once. Thus Burian and Schur believe that in nephrotomized dogs, and probably also in normal dogs, the liver destroys the uric acid of endogenous origin. Further experiments by the same investigators, less well founded, we fear, indicate that the human kidney, unlike the dog's, has the power of destroying uric acid, and that the human liver is far less capable of decomposing uric acid than is that of the dog. Burian and Schur reach the general conclusion that the uric acid of endogenous origin is always destroyed, and therefore that uric acid is to be regarded not as a terminal product of metabolism of the purin bodies, but as an intermediary product of that metabolism. We present these conclusions, but are as yet unable to accept them as proved.

The question now arises: What is the exact nature of the decomposition of uric acid in the body, and what are the products of its cleavage? It has been shown by laboratory experiments that uric acid can be broken up *in vitro* in at least three different ways: First, on treatment with concentrated hydrochloric acid, under special conditions, it yields glycocoll, carbon dioxid and ammonia. Second, on treatment with nitric acid, it yields first alloxan and later parabanic acid and carbon dioxid; the parabanic acid then goes to oxaluric acid and later still to oxalic acid and urea. Third, on treatment with permanganate of potash, uric acid is split to allantoin and carbon dioxid, and the allantoin on oxidation yields urea and oxalic acid.

Physiologic chemists have been interested in finding out whether uric-acid decomposition in the body follows any one of the above three routes, or travels along a path of its own. Urea, glycocoll, oxalic acid and allantoin have all been demonstrated in the animal body, and all have at one time or another been supposed to be related to the decomposition of uric acid. It will be noted that no matter which of the three modes of decomposition mentioned above were followed in the

1. Wöhler u. Frerichs: Ueber Veränderungen, welche namentlich organische Stoffe beim Uebergang in den Harn erfahren, Ann. d. Chem. u. Pharm., lxv, p. 335, 1848.
2. Weintraud, W.: Ueber Harnsäure im Blut und ihre Bedeutung für die Entstehung der Gicht, Wiener klin. Rundschau, x, 1896, Nos. 1 and 2.
3. Ebstein u. Nikolaier: Ueber die Ausscheidung der Harnsäure durch die Niere, Virch. Arch., cxliii, 1896, p. 337.

body, urea would always arise, since in the second and third methods urea is formed directly and by the first method the glycocoll would burn to urea; so the evidence of an increased urea formation after feeding uric acid affords no clue as to the way in which the uric acid breaks down. It would take too long here to review in detail the many experiments which have been made to settle this question, but it may be stated that thus far it has not been demonstrated with certainty that either oxalic acid or allantoin is produced in the animal body as a result of the decomposition of uric acid. It has been definitely proved, however, that glycocoll arises in man and animals as a result of the cleavage of uric acid.[4] It seems probable, therefore, that when uric acid is decomposed inside the body it undergoes cleavage by the first method described; that is to say, it is split into glycocoll, carbon dioxid and ammonia. The possibility of the occurrence of decomposition by other methods, however, is by no means positively excluded.

Just how the cleavage is brought about is a point which is beginning to be studied. Croftan,[5] as a result of a series of careful experiments, suggests that an albumose-like body loosens the affinities of the uric-acid molecule, and that a nucleo-proteid, acting as an oxygen carrier, facilitates the subsequent oxidation. At any rate, there seems to be a catalyzer concerned in the process that is destroyed by heat.

We have next to consider the exact localization in the body of the processes of uric-acid formation and decomposition. To the work which has been done on this subject we hope to refer next week.

TESTIMONIALS.

A booklet recently issued by a proprietary medicine firm contains interesting subjects for reflection. About a score of "testimonials" are presented, and those from a good-sized western city are peculiarly noteworthy. Certificates from two physicians in good standing alternate with certificates from three notorious quacks. The position of these physicians is certainly neither enviable nor comfortable, but it is an admirable object lesson to those who are tempted at times to write a testimonial.

COMPULSORY VACCINATION CONSTITUTIONAL.

One of the stock arguments of the antivaccinationists has been that compulsory vaccination is contrary to the Constitution of the United States. They have prated of "personal liberty," and have made dire threats of what they would do. In some states, weak-kneed courts have encouraged them in their delusions at the expense of public health and at the cost of the lives of the innocent. In Massachusetts especially they have fought compulsory vaccination, finally carrying the fight to the highest tribunal. And they have lost! February 20 the Supreme Court of the United States, speaking through Mr. Justice Harlan, held the Massachusetts compulsory vaccination law to be constitutional on the ground that in the protection of the health of the community compulsory vaccination may be exercised by the state as a police regulation. So those boards of health that have been timid in the past may now take courage. Proper state legislation for the abolishment of smallpox is made possible without any fear as to the constitutionality of such action.

4. Wiener, H.: Ueber das Glycocoll als Intermediäres Stoffwechselprodukt, Arch. f. exper. Path. u. Pharmakol., xl, 1897, p. 313; Ueber Zerzetzung und Bildung der Harnsäure im Tierkörper, Ibid., vol. xlii, 1899, p. 375.

5. Croftan, A. C.: Synopsis of Experiments on the Transformation of Circulating Uric Acid in the Organism of Man and Animals, Med. Rec., New York, lxiv, 1903, pp. 6-11.

POLITICIANS WIN TEMPORARILY IN OHIO.

It is reported that the governor of Ohio has directed the board of trustees of the Ohio Hospital for Epileptics to ask for the resignation of the superintendent, Dr. A. P. Ohlmacher. By those who knew the strength and methods of the political ring that sought his removal, this action is received without surprise. It is not to the credit of the governor that he should take his action without waiting to investigate the superintendent's specific charges that some of the subordinate officers of the hospital have been conniving with outside politicians to defraud the state through the sale to the institution of many articles at prices above their real value. Dr. Ohlmacher has publicly submitted for investigation the items of graft, and has asked a public investigation of all the institution's affairs before his departure on March 15. By complicating the issue, the time-worn method of their kind, the grafters have won. It is announced that the post will not be filled before July 1. The medical profession of Ohio should use every influence to force the trustees to choose for the place another man as capable and as uncompromising in his attitude toward graft as has been Dr. Ohlmacher.

A MARKED DECREASE IN TUBERCULOSIS MORTALITY.

One of the achievements of the International Cigarmakers' Union that redounds to its credit is the fact that it has reduced the death rate from pulmonary tuberculosis among its members from 51 per cent. to 24 per cent. This reduction has taken place since 1888, or two years and eight months after the eight-hour law went into effect, and during the same period the length of lives of the members has been increased from 31 years, 4 months and 20 days to 47 years, 3 months and 12 days. The latest government statistics place the number of cigarmakers who die from pulmonary tuberculosis at 62 per cent., and places them second in the list. The government figures, however, include both union and non-union workers, and as the death rate from pulmonary tuberculosis of union men is 24 per cent., it follows that the death rate of non-union workers is even greater than 62 per cent., or, approximately, 76 per cent. The probable reason for this difference in mortality from tuberculosis between union and non-union cigarmakers is to be found in (1) shorter hours, (2) better sanitary conditions, (3) better treatment, (4) more independence, (5) better education, and (6)

better wages. Such excellent achievements as this deserve the approbation of medical men, and the emulation of laborers in other employments which tend toward impairment of health.

INSANE SELECTION OF INSANE HOSPITAL SITES.

The newspapers, with some political motives, are severely criticising the New York State Lunacy Commission for purchasing a hospital site, at a cost of $42,000, which will require the expenditure of $30,000 more for a water supply. *Charities* does not spare severe words in its discussion of several hospital sites in New York. It seems that a committee of the New York Assembly has been appointed to investigate the last blunder, the purchase of the Baker farm at Comstock, Washington County. The editor remarks that it would be extravagant for the state to receive the site as a gift, in view of the necessity for all time to come of hauling supplies and of transporting patients and their friends from markets and centers of population to this out-of-the-way spot. In the interests of economy, the Buffalo *News* recommends putting the Baker farm on the market and purchasing a site elsewhere, rather than trying to utilize this undesirable piece of property. Reference is made to the blunders in the location of the Willard, the St. Lawrence and the Gowanda State hospitals. Out-of-the-way sites were chosen, and the opportunity for viewing these blunders in the light of later experience would appear to make this latest blunder inexcusable. The criticisms of partisan papers may not always be depended on, but the arraignment by the editor of *Charities* is a severe indictment of the New York State Lunacy Commission.

THE NATURE OF THE LEISHMAN-DONOVAN BODIES.

In a previous editorial[1] we called attention to these peculiar bodies found in the splenic blood of cases of kala-azar and so-called dum-dum fever. At the time of their discovery they were supposed to be an entirely new form of parasite, since they did not correspond to any of the known forms. We believe it was Leishman who suggested at this time that they represented a form of trypanosoma, but this idea did not gain foothold, as it was discountenanced by such an eminent authority as Laveran. Later Rogers, and still more recently Chatterjee, showed by cultivation that the parasite was, in fact, closely allied to the trypanosomes. In his last communication, Chatterjee[2] shows that if the splenic blood from an infected case is introduced into a 5 per cent. solution of citrate of sodium there develop in a few days bodies which closely resemble the trypanosomes. The Leishman-Donovan bodies gradually become more elongated, the micronucleus moves to one end of the body, and a thick flagellum is formed at this end. The organism differs from the true trypanosomes in the fact that the posterior flagellum is only rudimentary, as is the undulating membrane. This places the organism in a class with the genus *Trypanopsis*, of which one or two other members have been described.

1. THE JOURNAL A. M. A., Aug. 6, 1904.
2. Lancet, Jan. 7, 1905.

THE PROPHYLACTIC AND CURATIVE VALUE OF DIPHTHERIA ANTITOXIN.

The marvelous saving of life that has been effected by means of the prompt and vigorous employment of antitoxin in the prevention and treatment of diphtheria is one of the triumphs of scientific medicine. That antitoxin has reduced the mortality in this disease enormously is an established fact, and we have become so convinced of this that nowadays little is said regarding it. However, it is well occasionally to call attention to this fact, and to emphasize its importance. Last week we published an abstract of a paper by Dr. Franklin Royer,[1] read before the Philadelphia County Medical Society, in which the author presents some convincing statistics by making a comparison of the mortality between the number of cases of diphtheria recorded in the larger cities of this country, by decades, before and after the introduction of the antitoxin treatment. These statistics are an added proof that since antitoxin has been used there has been a marked decrease in the number of deaths from diphtheria. By the use of antitoxin, a disease, which a few years ago was one of the most deadly and dreaded, has been brought under control, and is now one of the simplest with which the physician has to deal. The former mortality of from 30 to 50 per cent. has been reduced exactly one-half, and there is reason to believe that, if antitoxin were administered early enough and in sufficiently large doses, this mortality might be reduced still further.

INTERNATIONAL EXCHANGE OF PROFESSORS.

The proposed international exchange of professors between the United States, Germany and France has been discussed with much interest recently, and we understand that one university in this country has taken the initiative in such an arrangement with a German university. There is much that is commendable in the plan. It enables students who have not the means for study in foreign universities to profit by the teaching of men who are recognized as authorities in their subjects. The public would be benefited, not only through the effects of the spread of knowledge which come to them indirectly, but also through the influence exerted on the press by the teachings of such men, and thus useful knowledge would be popularized. Intimate contact between men of different nationalities influences public sentiment and increases friendly feeling between nations. Few professors would fail to appreciate the opportunity of gaining a larger audience and of greatly extending their influence in this way; this in itself is one of the greatest rewards of an academic career for many men who choose to teach. The professors themselves would also be broadened by contact with fellow-workers of a different nationality, and would almost certainly become more valuable in the work of their home university. In the past it has been customary for ambitious students to go to the sources of knowledge, and this has been specially true of medical students. The number of American medical students who have availed themselves of the opportunities for study in the clinics, laboratories and lecture halls of leading

1. THE JOURNAL, Feb. 18, p. 568.

foreign universities has always been great and the number seems to be increasing in spite of the fact that there has recently been such great improvement in the methods of teaching and the opportunities for medical study at home.

AMBIDEXTERITY.

The faculty of being able to use the right and left hands interchangeably has long been considered desirable in surgeons, and by some has been urged as a desideratum for all engaged in work requiring manual dexterity. In England the matter has been carried so far that an "Ambidextral Culture Society" has been formed, which distributes considerable literature on the subject. At first sight such a faculty seems eminently desirable, and undoubtedly is so in a limited number of callings. In any attempt to supersede a natural and instinctive manner of doing things it is well to dispassionately review the why and wherefore of the process before suggesting sweeping changes, and it is doubtful whether the Ambidextral Culture Society has done this. Harman[1] has recently sought to explain why we are naturally righthanded, and to show that our apparent righthandedness is in reality a form of ambidexterity. He suggests that our righthandedness comes down to us from the period when human ascendency was dependent on physical prowess, and depends on the knowledge of the vulnerable heart region. Under such circumstances, he suggests, man learned to use his right arm as a fighting arm and his left arm as a shield arm. This tendency has been inherited, and is seen to-day in the use of the right hand as the active agency, while the left is used as a supplementary assistant. Harman's argument is that the supplementary work performed by the left hand is, in its way, just as important as the active work performed by the right. In other words, while we are not ambidextrous in the strict sense of the word, we are eminently gifted with co-ordination of bimanual action. This being the case, it would seem undesirable to advocate any widespread training such as the Ambidextral Culture Society suggests.

CONGENITAL MYATONIA.

Myatonia—as opposed to myotonia or motor spasm—is the term applied by Oppenheim to a condition of deficiency or absence of muscular tone that he has observed especially in children during the first year or two of life. It may involve the entire body or it may be confined to certain portions, the affected parts being flaccid and motionless. The tendon-reflexes are diminished or abolished, and the involved joints are unduly movable, while active motion is impaired. The muscles supplied by the cranial nerves usually escape, as does also the diaphragm. The affected muscles are flaccid, soft and thin, and the electrical reactions are diminished quantitatively. Intelligence, sensibility and the special senses do not suffer, and the functions of the sphincters are preserved. The condition appears to be of congenital origin, and it is thought to be due to an arrest in the development of the muscles. It differs from progressive muscular dystrophy in the absence of a familial tendency and in a failure of the symptoms to progress; from acute anterior poliomyelitis in its congenital origin and in the absence of true muscular atrophy, of degenerative electrical reactions and of changes in the ganglion cells of the anterior horns of the spinal cord; from amaurotic family idiocy in the tendency to improvement rather than to a fatal termination, in the absence of changes in the eyegrounds and of gross pathologic alterations in the nervous system. A case of congenital myatonia with necropsy has recently been reported by Dr. William G. Spiller.[1] The patient was a male child, 22 months old, born without complication at term and breastfed. Nothing was noticed until the age of 5 months, when he did not seem normally to take notice of things about him. He was at no time able to hold objects in his hand. He was fairly well developed, and the muscles appeared not to be wasted, though soft and flabby. Muscular power was diminished and the knee jerks and the heel jerks were absent. The legs could be overextended on the thighs. The child was able to sit unaided only for a minute or two, though the head would fall slightly forward. He had always been unable to stand. Death resulted from some intercurrent febrile disorder. On postmortem examination, the absence of muscular rigidity was striking, the hypotonicity being not less than during life. There was an excess of subcutaneous fat, and the muscles were pale, flabby and small in size, and they contained a large amount of fatty connective tissue, with a considerable increase in the nuclei. The muscle-fibers were reduced in size, with well-preserved transverse striation and less distinct longitudinal striation. The brain, the nervous system, the cord and the peripheral nerves were found normal, both macroscopically and microscopically. The essential lesion would thus appear to consist in an arrest in the development of the muscle-fibers, and, accordingly, some measure of improvement may be hoped for in cases subjected early to appropriate treatment, including, in addition to a nutritious diet, passive and active exercise and electrical stimulation of the affected parts.

1. British Medical Journal, Jan. 7, 1905.

1. University of Pennsylvania Med. Bull., January, 1905, p. 342.

Medical News.

CALIFORNIA.

Unlicensed Practitioner Fined.—"Dr." Annie D. Howe, Oakland, was fined $300, January 30, for practicing medicine without a license, and paid the fine.

Personal.—Dr. Thomas N. Sample, Fresno, has been elected physician of Fresno County.——Dr. P. C. Campbell, Point Richmond, has been appointed a member of the governor's staff.

Anti-Vaccination Bill Goes to House.—Senator Leavitt's anti-vaccination bill, after a strenuous fight, was passed by the senate, February 8, by a vote of 22 to 15, and has now gone to the assembly.

Automobile Sterilizer.—San Francisco is to have an automobile sterilizer weighing four tons, with a maximum speed of five miles an hour, and to cost $4,000. The disinfecting compartment is large enough to hold all the bedding of the household.

CONNECTICUT.

Emergency Hospital.—Dr. John W. Johnson, Torrington, opened on February 11 an emergency hospital with a capacity of two beds, later to be increased to four.

Personal.—Dr. Elmer F. Blank has been re-elected president of the Bridgeport Board of Health.——Dr. Samuel D. Otis, Meriden, slipped on the ice and fell, January 30, dislocating one knee.——On February 1 Dr. George L. Beardsley entered on his two years' duty as health officer of Derby.

Bequests to Grace Hospital.—The Probate Court has decided that $10,000 shall be paid to Grace Hospital from the estate of the late Charles D. Hall, and that, on the death of Miss Amelia M. Stannard, who holds a life interest in the estate, $30,000 from the estate of the late Mrs. Sylvia C. Hall will be available for the hospital.

January Deaths.—During January 1,402 deaths were reported, 141 more than in December, 38 less than in January, 1904, and 35 more than the January average for the five previous years. The death-rate was equivalent to an annual mortality of 17.3 per 1,000. Pneumonia caused 189 deaths; diseases of the nervous system, 168; heart disease, 135; consumption, 134; influenza, 66; violence, 64; bronchitis, 39, and diphtheria, 37.

DISTRICT OF COLUMBIA.

Government Clerks Must Pay Their Physicians.—A bill has been introduced in the house requiring government clerks to pay their debts, including medical fees. The measure provides that whenever any civil service employe of the United States shall, after three demands in writing, refuse to pay an indebtedness for house rent, fuel, groceries, household necessities, clothing, physicians' services, etc., "consistent with such employe's social position in life," provided the indebtedness shall have been contracted after entrance into the service, such refusal shall be cause for immediate suspension. Suspension shall continue until settlement is made. If a satisfactory settlement is not made within three months, the employe "shall be stricken from the rolls as incompetent and unworthy."

GEORGIA.

Wesley Hospital Assured.—The Christmas offering of more than $27,000 made by Georgia Methodists for the benefit of Wesley Memorial Hospital, Atlanta, has assured the success of the enterprise. Work on the building will be commenced in a few weeks.

Personal.—Dr. Charles F. Benson has been re-elected president of the Atlanta Board of Health.——Dr. William L. Gilbert, Atlanta, has been appointed surgeon of the First Cavalry, Georgia State Troops, with the rank of major, vice Dr. William W. Owens, Savannah, resigned.

Medical Training School Opens.—The Southern Medical Training School, designed primarily for the training of medical missionaries, but also offering instruction to students of medicine and nurses, was opened February 2 in Atlanta. Dr. J. McFadden Gaston is chairman of the trustees of the institution.

Ill and Injured.—Dr. Samuel A. Visanka, Atlanta, has been seriously ill with typhoid fever.——Dr. James C. Fussell, Fitzgerald, was injured, February 8, in a runaway accident.——Dr. Henry W. Clements, Lenox, while hunting, February 3, shot himself through the left foot, necessitating the amputation of two toes.

ILLINOIS.

Hospital Sunday in Evanston.—On February 12 nearly $4,000 was contributed by the churchgoers of Evanston for the benefit of the Evanston Hospital.

Fire Destroys Office.—In a fire in East St. Louis, February 10, the office of Dr. James W. Rendleman was destroyed, and also the furniture and instruments of the late Dr. A. C. Corr of Carlinville, which had not yet been removed.

Early Diagnosis of Tuberculosis.—The State Board of Health has issued for distribution to physicians throughout the state a circular on "The Early Diagnosis of Tuberculosis," which includes in concise and systematic form all the information on the diagnosis of the disease to be obtained from a review of American and foreign medical literature.

Aerial Disinfection.—The State Board of Health is preparing to make an elaborate series of investigations on aerial disinfection by formaldehyd to ascertain definitely the value of a process recently recommended by the State Board of Health of Maine. This process is simple, and requires no lamp or other heat which might be a source of danger from fire. It consists simply of pouring formaldehyd solution on permanganate of potash, the only requirement being that the formaldehyd solution be of good and reliable quality and used in proper proportion to the permanganate of potash.

Chicago.

Antispitting Crusade.—Acting on orders from the chief of police, violators of the antispitting ordinance were arrested February 20. On the first day 171 arrests were made.

Library Bequeathed to Rush.—By the will of the widow of the late George P. A. Healy, the fine medical library collected by the late artist is bequeathed to Rush Medical College.

Deaths of the Week.—During the week ended February 18, 630 deaths were reported. Pneumonia led the death causes with 136; consumption caused 73 deaths; heart diseases, 45; Bright's disease, 36; bronchitis, 35; violence 34, and smallpox 4.

Many Deaths.—A total of 426 deaths was recorded during the first four days of the week—a total which represents an annual death rate of 30.2 per 1,000. This is a figure not reached before since 1866, and the officials were apprehensive of a record-breaking week. Fortunately, the returns fell from this daily average of 106.5 to an average of 68 during the last three days, and the mean mortality rate of the week was only 16.50, as compared with 17.61 for the corresponding week of last year, and of 16.83 for the average February death rate of the previous decennium. There was a marked reduction in the reported deaths from the contagious diseases of childhood, from influenza and from typhoid fever, as compared with the preceding week. The respective totals of these deaths are 20 for the week and 38 for the week ended February 18. Laboratory indications point to a continued decrease of diphtheria; only 1 out of 32 cultures showed the presence of the diphtheria bacillus, while during the week before it was found in 7 cultures out of 34. On the other hand, the influenza bacillus was found in 13 of the 32 cases of suspected diphtheria, and the bacteriologists believe that influenza is frequently diagnosed as diphtheria.

INDIANA.

Aimed at Patent Medicine Men.—A bill has been introduced by Senator Mountz which provides that it shall be unlawful to sell or to offer for sale any proprietary medicine, unless the correct formula shall be printed on each package. The fine for violation of this law is elastic, ranging from $5 to $1,000.

Personal.—Dr. John F. Robertson, Indianapolis, has been appointed assistant deputy coroner of Marion County.——Dr. C. Homer Stalker has resigned as surgeon of the Indiana State Soldiers' Home.——Dr. Samuel M. Ried, Muncie, is critically ill.——Dr. Noah S. Wood, Anderson, is seriously ill.——Dr. John N. Parr, Jolietville, who has been ill with influenza, has had a relapse and is in a critical condition.——Dr. Francis M. Warford, Cicero, is reported to be critically ill.

Verdict for Defendant.—In a suit in which Dr. David Gardner, acting health officer, Lehigh, Ind., and the City of Lehigh were sued by Cyrus Miller for the value of property destroyed through the alleged negligence and carelessness of the first defendant, the jury found for the defendants. In order to fumigate clothing of a smallpox patient residing outside the city limits, Dr. Gardner brought the clothing to a vacant store, and proceeded to employ disinfection by formalin vapor. The building took fire, and, with ten other buildings, was destroyed. The court decided that the physician had not been negligent, and that the city was not liable.

January Disease and Death.—In January influenza was the most prevalent disease; in December bronchitis was most prevalent. Pneumonia, which stood fifth in December, rose to second place in January and scarlet fever and diphtheria increased. The order of disease prevalence was: Influenza, pneumonia, tonsillitis, bronchitis, rheumatism, scarlet fever, diphtheria, typhoid fever, smallpox, measles, whooping cough and cerebrospinal meningitis. A decrease appears for smallpox, as compared with the corresponding month last year. The figures are: 480 cases, with 8 deaths in 38 counties in January, 1904, and 218 cases with 7 deaths in 27 counties in 1905. The cases of typhoid fever numbered 173, with 50 deaths in 41 counties. The same month of last year there were 182 cases, with 38 deaths in 53 counties. This is an increase by this comparison. Three hundred and ninety-six deaths from tuberculosis occurred, as against 361 in January, 1904. Of the deaths 177 were males and 219 females. Two hundred and sixty-seven, or 67.5 per cent. were in the prime of life period of 18 to 50. Of the females, 82 were mothers between the ages of 18 and 40, and they left 168 orphans under 12 years of age. Of the males, 20 were fathers in the same

age period, and they left 48 children under 12. Consumption, therefore, in the one month made 216 orphans under 12, made 20 young widows and 82 young widowers, and invaded over 300 homes. Pneumonia caused 558 deaths; in the same month last year, 540. Deaths from all causes in January numbered 3,309, an annual rate of 14.7 per 1,000. In the same month of last year the number was 3,117, the rate of 14.8 per 1,000.

MARYLAND.

Baltimore.

Pneumonia Leads.—There were 43 deaths last week from pneumonia, only 21 being ascribed to consumption.

Book and Journal Club.—The Book and Journal Club of the Medical and Chirurgical Faculty has been in existence nine years, during which time it has collected and spent for the library about $4,300. In addition to paying for the binding of many journals, this money has purchased 57 journals yearly and 258 books. The faculty was able last year to appropriate only $1,200 to the expenses of its library. Of this $825 was spent in salaries, $288 in journal subscriptions, $300 in binding, $100 for typewriter and $75 for supplies, making the total expenditures $1,588 and leaving a deficit of $388. The club held its midwinter meeting February 15, when Dr. William Osler gave a reception to Dr. William W. Keen of Philadelphia, who spoke of his surgical reminiscences of the war, and Dr. William H. Welch spoke on medical literature of the Civil War.

Tuberculosis Dispensary Open.—The opening of the new dispensary for tuberculous patients at the Johns Hopkins Hospital, built through the generosity of Mr. Henry Phipps, took place February 21. The Laennec Society, founded some years ago by Dr. William Osler for the study of tuberculosis and of measures for its prevention, had charge of the ceremonies, holding its monthly meeting at the same time. Dr. Henry Barton Jacobs, the president of the Laennec Society, presided and delivered an address on "The Origin and Rise of Tuberculosis Dispensaries"; Dr. Herman M. Biggs of the City Health Department of New York spoke on "The Advantages of a Tuberculosis Dispensary," and Dr. William Osler spoke on "Tuberculosis in the General Hospital." The building is substantial and in keeping with the architecture of the other Johns Hopkins buildings. Its erection has consumed the entire gift of $20,000. It is a dispensary pure and simple and in no sense a sanatorium. Its chief purpose is to segregate tuberculous from other patients. Mr. Phipps himself attended the ceremonies. The dispensary will be under the charge of Dr. Louis V. Hamman and assistants. Patients will be admitted after March 1.

Johns Hopkins Hospital Work.—At the annual meeting of the board of trustees of the Johns Hopkins Hospital, February 14, the report of the superintendent was presented. During the year about $200,000 has been expended on improvements. This includes the erection of the new surgical ward and the tuberculosis dispensary; also reconstruction of the laundry, with installation of a lot of new machinery, electric wiring of the buildings and the installation of several dynamos, which will make it possible to light the entire hospital with electricity by June 1. The establishment of new quarters for the orthopedic department, including a gymnasium, examining rooms, plaster rooms, operating and dressing rooms, the opening of a new private ward and the building of a stable. During the year ended January 31, 4,531 patients were treated, 2,296 males and 2,235 females, of whom 3,482 were white and 1,049 colored. Of these 3,327 were discharged as well or improved and 280 died, the percentage of mortality being 6.18. In the dispensary about 61,000 visits were made by patients. Dr. G. R. Holden was appointed resident gynecologist to succeed Dr. F. C. Burnam, resigned, and Dr. Stephen Rushmore was appointed assistant. Miss E. Blanche Sterling was appointed assistant medical gymnast in the orthopedic dispensary. Mrs. William Osler presented to the hospital a bronze profile of her husband.

MASSACHUSETTS.

Beginning of Brigham Hospital.—The Peter Bent Brigham Corporation has begun to acquire property on Bowdoin Street, near Cambridge Street, in the West End, Boston.

Cremation in Favor.—Cremation is gaining in favor with people of Boston and vicinity, as shown by the increased number of cremations at Mount Auburn cemetery. In 1904 there were 180, as against 153 in 1903.

Dipsomaniacs Cured.—At a legislative hearing relative to the abolition of the Massachusetts Hospital for Dipsomaniacs and Inebriates at Foxboro, the trustees testified that during the past five years 21 per cent. of those admitted had been discharged cured.

Waltham Medical Examiner.—A strong petition has been filed with Gov. Douglass against the re-appointment of Dr. Julian A. Mead of Watertown as medical examiner. Objection is based chiefly on Dr. Mead's testimony in a recent murder trial. Petitions favoring three Waltham practitioners are being circulated.

Examination for Bacteriologists.—The position of bacteriologist to the Cambridge Board of Health will be filled by a competitive examination to be conducted by Drs. Harold Ernst and Hibbert Hills. Dr. John R. Sennot, who at present holds the position, was appointed two years ago, and was not reappointed when his term expired February 1.

Street Car Air.—In a hearing before the legislative committee on street railways on a petition asking for laws for improved ventilation, John P. Fox maintained that he had experimentally tested the air in the street cars of Boston on bad days and had found that it contained only 9 parts of carbon dioxid to 10,000, which he considered not at all injurious.

Personal.—Dr. W. R. Brinkerhoff, who was Dr. Tizzer's associate at Manila, has arrived at Alexandria, Egypt, en route to join the Carnegie Archeologic Expedition to the Trans-Caucasus, of which he is physician.——Dr. Albert L. Norris, Cambridge, is seriously ill at the Corey Hill Surgical Hospital, Brookline.——Dr. and Mrs. William N. Swift, New Bedford, celebrated their silver wedding February 15.

Municipality Wins.—The Board of Health of Everett has won in a suit brought against it by a Mrs. Salinger, in whose house a case of smallpox occurred in 1901. The house was at once taken for a pest-house, being rented at the full regular rates. She brought suit to recover $3,000 more than the rent because of "wear and tear and fumigation and the evil reputation of a pest-house," which she alleged had lessened the value of the property.

Board of Health Changes.—Cambridge has a recurrence of its board of health troubles. Dr. Felix McGirr, who has been in charge of the contagious hospital the past year, was refused a re-election, and Dr. David C. Dow, who preceded him, was again elected. Dr. Edwin Farnham was re-elected medical inspector and physician of the board of health, and Dr. C. P. Feeley was elected school inspector in place of Dr. John P. Nelligan. Dr. Charles G. Weeks was re-elected chairman of the board.

Tufts Medical Announcements.—President Capin of Tufts College reports that there are this year in the medical school 409 students and 107 instructors. The following new appointments have been made: Dr. Henry B. Chandler, professor of ophthalmology; Dr. Walter Elmore Fernald, clinical lecturer in mental diseases; Dr. Charles Melville Whitney, instructor in genito-urinary diseases, and Dr. Ralph Clinton Larrabee, instructor in clinical medicine and hematology.

Hospital Concerts.—Six hospital concerts will be given during March, under the personal supervision of Dr. John Dixwell, by trained professionals, under the auspices of the Hospital Music Fund: March 1, at the Church Home for Orphan and Destitute Children; March 5, at the Children's Hospital; March 10, at the Mt. Hope Home for Children; March 12, at the Brookline Free Hospital for Women; March 19, at the Woman's Charity Club Hospital, and the Cushing Hospital, and March 26, at the New England Baptist Hospital.

Newton Hospital Report.—During 1904, 927 patients were cared for in the Newton Hospital, an increase of 13 per cent. over 1903. The cost per patient in the general wards was $13.51 per week, and in the contagious wards $16. The endowment fund has been increased by $7,000 during the year, and $10,109 was contributed by the churches on Hospital Sunday. The hospital itself has earned during the year $32,210 out of the total receipts of $56,871, a balance over expenses of $2,895. The total assets as reported by the treasurer are $231,681.

State Registration of Nurses.—Energetic efforts are being made by the Massachusetts State Nurses' Association and its friends to secure the passage of a bill for the registration of nurses. Their measure is strongly supported by nurses and physicians, but opposed by others who find fault with the requirements of the bill, which would exclude nurses who are graduates of many of the smaller hospitals and also object to the stipulation that the board of registration shall be appointed

by the governor from a list to be submitted to him by the association.

Dealers in Pure Food Crusade.—The activity of the State Board of Health in prosecutions for sale of impure food has induced the dealers in the Faneuil Hall Market, Boston, to adopt the following resolution: "We will not knowingly sell or have in our possession with intent to sell any article of food that contains any preservative or foreign substance intended to improve the condition or appearance of the same, and we will notify all manufacturers from whom we are purchasing our supplies, that we will not receive or handle goods so prepared."

Children's Hospital Report.—During the last year there were treated at the Boston Children's Hospital 1,505 cases in the hospital proper, and 28,008 in the out-patient department, of which 6,341 were new cases. The great increase since 1890, when there were 442 house patients and 1,712 new out-patients, emphasizes the fact that the work of the hospital has outgrown its accommodations. There is an annual deficit of $13,000. Plans for a new hospital to be located near the new Harvard Medical School are near completion. The Convalescent Home in Wellesley is now nearly finished.

Technology Students Healthy.—Dr. Franklin White, medical adviser to the Massachusetts Institute of Technology, reports that during the last year only 185 out of the 1,600 students consulted him. Two left their work because of pulmonary tuberculosis and two because of heart disease. A few were sent to the Massachusetts General Hospital, where the institute has free beds. His investigations of the general health of the students shows that two-thirds of the members of the junior and senior classes are never absent a day because of illness, that only about 10 per cent. had any important illness during their four years' course, and that nearly all finished in good general health. Lack of physical exercise and inefficient sleep are the common causes of illness among the students.

MICHIGAN.

State Board Appointments.—Dr. Angus McLean, Detroit, has been appointed a member of the State Board of Health, vice Dr. Daniel A. MacLachlan, term expired. Dr. Malcolm Sinclair, Grand Rapids, succeeds Dr. Collins H. Johnston as a member of the board.

Comparative Disease Prevalence.—For January, compared with the average for January in the ten years, 1895-1904, smallpox, measles and cholera morbus were more than usually prevalent; scarlet fever, pneumonia, intermittent fever, erysipelas, diphtheria, whooping cough, puerperal fever, remittent fever and dysentery were less than usually prevalent.

The Most Dangerous Communicable Diseases.—Whooping cough was reported in Michigan during January at 10 places; meningitis at 15 places; measles at 63 places; diphtheria at 83 places; scarlet fever at 109 places; pneumonia at 101 places; smallpox at 104 places; typhoid fever at 108 places; and consumption at 267 places. Whooping cough was reported present at 9 places less; meningitis at 10 places more; measles at 12 places more; diphtheria at 8 places less; scarlet fever at 17 places less; pneumonia at 19 places more; smallpox at 3 places more; typhoid fever at 3 places more, and consumption at 26 places more in January than in the preceding month.

Mortality of Michigan During January.—The total number of deaths for January was 3,084, corresponding to an annual death rate of 14.2 per 1,000. This rate is higher than that for the preceding month, which was 13.0 per 1,000, but lower than that for January, 1904, which was 14.7 per 1,000. Important causes of deaths were as follows: Tuberculosis, 222; typhoid fever, 37; diphtheria, 56; scarlet fever, 16; measles, 14; whooping cough, 3; pneumonia, 352; diarrheal diseases of infants under 2 years of age, 54; meningitis, 38; influenza, 120; cancer, 142, and accidents and violence, 139. There was an unusually large number of deaths from smallpox during the month, distributed as follows: 1 in Battle Creek City, Calhoun County; 2 in Hillsdale City, Hillsdale County, 5 in Jackson City, and 2 in Columbia township, Jackson County.

NEW JERSEY.

Montclair Hospital Opens.—Mountainside Hospital, Montclair, opened its new building, February 7. By the completion of the new building, which cost $30,000, the hospital has now separate buildings for medical and surgical cases.

Medical Examiners Reappointed.—The senate confirmed the nomination of Drs. Davis P. Borden, Paterson, Charles A. Groves, Orange, and E. L. B. Godfrey, Camden, for reappointment as members of the State Board of Medical Examiners.

Camden's Health.—The report of contagious diseases for the month ended February 15, is as follows: Scarlet fever, 7; diphtheria, 19; tuberculosis, 7, making a total of 33. Last month cases of a contagious disease reported aggregated 64, making a decrease of 31. Tuberculosis is now classed among contagious diseases.

Bequests.—By the will of the late Dr. James D. Tantum, Trenton, $20,000 was devised to Mercer Hospital; $10,000 to St. Francis' Hospital, Trenton; $5,000 to McKinley Hospital, and $5,000 to the German Hospital, Philadelphia, all for the endowment of free beds.——Mrs. Mary E. Ryle, Paterson, left $20,000 to the Paterson General Hospital.

Physician vs. Medical Society.—Dr. Wilson G. Bailey, who was charged with violating the Principles of Ethics, and who was to have been tried before the board of censors of the Camden County Medical Society, has tendered his resignation as a member thereof. Dr. Bailey was charged with testifying in court against a fellow practitioner in violation of the Principles of Ethics.

Personal.—Dr. Onan B. Gross, Camden, and family, have gone to California for the winter.——Drs. Herman C. H. Herold and L. Eugene Hollister have been confirmed as members of the Newark Board of Health.——The staff of the Elizabeth General Hospital and Dispensary gave a banquet at the Astor House, New York City, January 19, in honor of Dr. Alonzo Pettit, president of the staff, who retired after a service of 27 years, at which he was presented with a silver loving cup.——Dr. W. Blair Stewart has been elected president of the medical staff of the Atlantic City Hospital, vice Dr. Byron C. Pennington, deceased; Dr. Elisha C. Chew, vice-president, and Dr. William Edgar Darnall, secretary.——Dr. William C. Sandy, Newark, has been appointed fourth assistant physician of the State Hospital for the Insane.

NEW YORK.

Typhoid in Poughkeepsie.—There are at present 26 cases of typhoid fever in Vassar Hospital. The cases are of a much more severe type than those of last year.

Scarlet Fever Epidemic.—There are 69 cases of scarlet fever in Mount Vernon, and new cases are being reported at the rate of six to seven daily. New Rochelle and White Plains are also suffering from an epidemic of the same disease. The Board of Health of Mount Vernon has passed a resolution compelling all milk companies to sterilize and disinfect bottles before refilling them; failure to comply is punishable by a fine of $50.

News from the Legislature.—The following resolution aims at an investigation of the present situation with reference to the adulteration of foods and medicines: "Resolved, That the commissioner of health be and hereby is requested to furnish to this house a statement of what effort has been made on the part of the Department of Health for the enforcement of said statute, and whether, in his opinion, other or increased facilities or enactments are essential for the proper enforcement of the pure food law within the state."——A measure has been introduced which provides drastic regulations for the employes of milk stations where, it is alleged, most of the adulteration is done. The bill provides that every person employed at a milk station shall take out a license from the state commissioner of agriculture. He must pledge himself under oath not to adulterate nor to permit the adulteration of milk. Violation carries with it disqualification for work in a milk station, in addition to the other penalties now provided.——The annual report of the state fiscal supervisor recommends appropriations for new buildings, improvements, etc., for the state charitable institutions that will aggregate $517,075, and the total appropriations for maintenance, etc., will aggregate over $2,000,000. ——In the absence of Senator Elsberg, another coroner's bill has been originated and advanced to the third reading by unanimous consent. This measure reduces the number of coroners in Manhattan from four to two, in Queens and in the Bronx from two to one, and leaves the number unchanged in Kings and Richmond. It fixes the salaries at an increased figure.

Buffalo.

Found Guilty.—Isaac A. Finch was found guilty in the County Court of practicing medicine without a license. He treated Otilia Hoffman before her death for cancer and then sent in a bill to the surrogate against the estate. The bill was disallowed on the discovery that Finch was not a physician.

Personal.—Dr. Roswell Park gave an informal party in honor of Hon. Charles Jerome Bonaparte of Baltimore.——Dr. DeVillo

W. Harrington, who has been ill, is in Washington, D. C., convalescing.——Dr. Julius Ullman was host of the evening at the regular monthly meeting of the Æsculapian Club. A paper on "Nephrolithiasis" was read by Dr. Charles Hoffman.

Central Union Library Wanted.—There is considerable agitation for a club home of the various clubs and societies of Buffalo where also the large medical library now distributed in the University of Buffalo library and the Grosvenor library could be amalgamated into one large and useful library and where lecture-rooms and club rooms could be at the disposal of physicians and medical clubs. Liberal offers of cash donations have already been made by a few physicians, and the subscriptions, in addition to the reserve fund of the Buffalo Academy of Medicine, amounting to $2,000 or $3,000, would be a nucleus for the acquisition of property.

New York City.

Maternity Opened.—The Manhattan Maternity and Dispensary at 327 East Sixtieth Street was formally opened February 15.

Death from Yellow Fever.—A sailor on the steamer *Orizaba*, from Colon, on February 10, developed yellow fever and died at the Swinburne Island Hospital.

More Spitters Caught.—Again the police squad attached to the Health Department have been on a hunt for these offenders. Thirty arrests were made in one evening in the theater district.

German Hospital Dispensary to Build.—The German Hospital has sold its dispensary at One Hundred and Thirty-seventh Street and Second Avenue, and will build a new one near the site of the hospital building at Park Avenue and Seventy-sixth Street.

Personal.—Dr. Emil Mayer has been appointed chief of clinic to the ear, nose and throat department of the Mount Sinai Hospital Dispensary.——Dr. James J. Walsh, who was in the wreck on the New York Central at Whitesboro, February 4, received a severe scalp wound requiring four stitches.

A Hospital for Insanity.—At a meeting in the interests of the American Institute for Scientific Research it was announced that the society had received a gift of $5,000, on condition that it raised $20,000, no limit being set as to the time required to secure this sum. As soon as the amount in the treasury warrants, it is planned to open a hospital where insanity may be treated as in hospitals on the continent.

Contagious Diseases.—There were reported to the sanitary bureau for the week ended February 11, 368 cases of tuberculosis, with 181 deaths; 275 cases of diphtheria, with 42 deaths; 246 cases of scarlet fever, with 14 deaths; 201 cases of measles, with 3 deaths; 28 cases of typhoid fever, with 4 deaths; 3 cases of smallpox, with 1 death; 101 cases of chickenpox, and 29 deaths from cerebrospinal meningitis.

First Aid.—The annual report of the Society for Instruction in First Aid to the Injured showed that 1,979 persons had received instruction from the society's agents. The total number instructed since organization is 19,435, of which 14,231 have passed examinations and received diplomas. At present the society is conducting 21 classes, 11 of which are in the public schools.

Cerebrospinal Meningitis.—The health commissioner states that while there are more deaths from this disease than there should be, they are probably due to the carrying over of cases from last year into this. During an epidemic thirty years ago the cases carried over from the year of the epidemic into the following year. A series of experiments with a proposed new cure for cerebrospinal meningitis are being carried on at Gouverneur Hospital, the report of which will be presented to the county medical society in due time.

Leprosy in New York.—Dr. Charles F. Roberts, the leprosy expert of the Health Department, denies the allegation of Dr. Dyer, consulting expert of the Louisiana leprosy camp, that there are two hundred lepers walking about the city. Dr. Roberts says that there are only three cases known to the health officials, and that these are public charges on Blackwell's Island. All the cases came here from other places. Dr. Roberts has never seen a case contracted in this country, and says that there is no reason for alarm.

The Subway Dust.—Among the arguments made for and against the continuance of a temporary injunction restraining city officials from removing the signs, slot machines and newspaper stands from the subway, George A. Soper, sanitary engineer, claimed that the subway is a dust pocket and its stations traps for the retention of microbes and bacteria. The diseases that are to be apprehended from this dust are pneumonia, bronchitis, whooping cough, diphtheria, influenza and tonsillitis. On the other side it was claimed that the metal frames used on the signs, instead of harboring bacteria, actually destroyed them.

PENNSYLVANIA.

Personal.—Dr. Addison M. Rothrock has resigned as anesthetist of the Chester County Hospital.——Dr. H. Melvin Allen, Reading, has been elected captain of Company A, Fourth Infantry, N. G. Pa.

Convicted of Illegal Practice.—Joseph C. Densten, Scranton, who claimed to have graduated from Jefferson Medical College in 1869, was found guilty, February 8, of practicing medicine without a license.

Sentenced for Malpractice.—Dr. Nathan Penrose, Allegheny, who was found guilty of criminal malpractice whereby the death of a young woman resulted in 1903, was sentenced February 3 to imprisonment for three years in the Western Penitentiary.

State Sanitarians Favor Free Antitoxin.—The free distribution of antitoxin by the state for the treatment of diphtheria was discussed at the closing session of the Associated Health Authorities and Sanitarians at its annual meeting in Harrisburg, February 15. It was advised that the committee on legislation should draft a bill for the attainment of this object and present it to the present session of the legislature if possible. The following officers were elected: President ex-officio, Governor Samuel Pennypacker; vice-presidents, Drs. Thomas N. McKee, Kittanning, Robert S. Maison, Chester, and H. E. Heiler, Hilltown; treasurer, Dr. Jesse Green, West Chester, and secretary, Dr. W. R. Batt, Philadelphia.

Philadelphia.

Bequests.—By the will of Isaac Rosskam the Jewish Hospital Association receives $2,500; the Jewish Foster Home and Orphan Asylum, $2,000; National Jewish Home for Consumptives, Denver, Colo., $2,000, and Free Hospital for Consumptives, White Haven, $1,000.

Municipal Hospital Report.—During January 146 patients were received at the hospital, 104 were discharged, and 24 died. The total number in the institution, January 31, was 188. The deaths for the month were as follows: Diphtheria 18, scarlet fever 5, other disease (not specified) 1. There is no smallpox in the institution at this time.

Health Report.—The total number of deaths reported for the week was 599. This is a decrease of 13 from last week, and a decrease of 4 from the corresponding period of last year. Of the 599 deaths reported, 122 were caused by pneumonia, 14 by influenza, 63 by pulmonary tuberculosis, 20 by bronchitis, and 3 by pleurisy, making a total of 222 deaths due to disease of the respiratory tract. The principal causes of death were typhoid fever 13, diphtheria 2, cancer 23, paralysis 29, heart disease 59, enteritis 16, and Bright's disease 51. The contagious disease cases reported numbered 224, with 30 deaths, as compared with 199 cases and 23 deaths for the preceding week.

Work of Health Bureau for January.—In the division of medical inspection the number of inspections made, excluding schools, aggregated 2,932. The total number of visits to schools was 5,154; 1,111 children were excluded from school; 1,551 persons were vaccinated; 123 injections of antitoxin were administered; 768 cultures were taken; 536 fumigations were ordered; and 97 cases were examined for special diagnosis. The report from the bacteriologic laboratory shows that 2,295 cultures were examined for diphtheria, 346 specimens of blood for Widal's reaction, 240 specimens of milk, 112 specimens of sputum, 1,676 bottles of antitoxin were supplied, and in the chemical laboratory 184 analyses were made. The division of vital statistics reports 1,996 deaths and 2,774 births.

New Hospital Opened.—The Union Mission Hospital at Fourth Street and Columbia Avenue was opened with formal ceremonies, February 22. This hospital has been established largely through the munificence and efforts of Mr. John B. Stetson. It is a three-story brick building, with a roof garden, especially arranged for the treatment of heat cases during the summer months, tents and tubs being erected for the special care of such conditions. The hospital will accommodate about 50 ward patients, and has 11 private rooms. An electrical department has been instituted in the building, with an *x*-ray and Finsen light plant. The following gentlemen compose the major staff of the institution: Medicine, Dr. John H. Dripps;

surgery, Dr. Harry C. Deaver; gynecology, Dr. Charles P. Noble; neurology, Dr. Henry P. Boyer; ophthalmology, Dr. Isaac Leopold; otology and laryngology, Dr. Charles B. Warder; dermatology, Dr. Jay F. Schamberg, and pathologist, Dr. Lewis S. Somers.

GENERAL.

American Anti-Tuberculosis League to Meet.—This body will hold its next meeting at Atlanta, Ga., April 17-19. The president is Dr. George Brown, Atlanta, Ga.

Medical Journal Suffers from a Fire.—The *Medical Library and Historical Journal* announces that the almost total destruction by fire of the establishment of its printers will delay the publication of the January number. This issue was being printed and it will be duplicated as soon as possible.

The Social Evil.—The American Society for Sanitary and Moral Prophylaxis was organized February 15 at a meeting of thirty physicians, clergymen and men of public spirit at the New York Academy of Medicine. It was stated that the society proposed to make an endeavor to have the social evil dealt with by the health department just as they handled other contagious and infectious diseases. It is suggested that circulars and pamphlets by competent authorities be distributed in colleges and schools where young men may get some idea of the extent of the peril to which they submit themselves. There is already $10,000 pledged to start the work. Officers will be elected at the next meeting.

Favor Bill to Organize the Army Medical Corps.—The House Committee on Military Affairs has authorized a favorable report on the Senate bill reorganizing the Medical Corps of the Army. The committee amended the bill by reducing the number of officers provided in the Senate bill in the regular corps, but making an actual increase in the present corps, as follows: Four colonels, 6 lieutenant-colonels, 25 majors, 60 captains or first lieutenants. By the terms of the bill these additional officers displace 135 contract surgeons now a part of the corps. The provision of the bill establishing a reserve medical corps by commissioning civilian physicians was amended by a provision forfeiting such commissions in case their holders refuse to perform service. The four members of the committee who opposed the bill in committee, on the ground that the auxiliary corps would be used as a means of securing promotions and further legislation for the active corps, gave notice of amendments to be offered in the House.

Army Medical Corps Examinations.—Preliminary examinations for appointment of assistant surgeons in the Army will be held May 1 and Aug. 1, 1905, at points to be hereafter designated. Full information and permission to appear for examination can be obtained from the Surgeon General, U. S. Army, Washington, D. C. The essential requirements to securing an invitation are that the applicant shall be a citizen of the United States, shall be between 22 and 30 years of age, a graduate of a medical school legally authorized to confer the degree of doctor of medicine, shall be of good moral character and habits, and shall have had at least one year's hospital training or its equivalent in practice. The examinations will be held concurrently throughout the country at points where boards can be convened. Due consideration will be given to the localities from which applications are received, in order to lessen the traveling expenses of applicants as much as possible. In order to perfect all necessary arrangements for the examinations of May 1, applications must be complete and in possession of the Surgeon General by April 1, and for the examination of August 1, by July 1. There are at present twenty vacancies in the Medical Corps of the Army.

CANADA.

The Canadian Association for the Prevention of Consumption.—The annual meeting of the Canadian Association for the Prevention of Tuberculosis is to be held at Ottawa on March 15.

Vital Statistics of St. John, N. B., 1904.—There were 739 deaths in St. John, N. B., in 1904, as compared with 771 for 1903. Of the total number of deaths 358 were males and 381 females. Two hundred and fifty-eight cases of contagious diseases were registered, with eighteen deaths.

A Union Banquet in Montreal.—It is good to be able to announce that the profession of Montreal, English and French, are drawing closer together day by day. February 21, both sections of the profession will enjoy a banquet under the joint patronage of the Montreal Medico-Chirurgical Society and the Montreal La Société Médicale.

Winnipeg News.—Dr. Neill J. McLean, Winnipeg, who went to London over a year ago, has been enrolled as a licentiate of the Royal College of Physicians and Surgeons of London, England.——Dr. Frank Wesbrook, Minneapolis, formerly of Winnipeg, recently visited Winnipeg.——Dr. Bracken, secretary of the Board of Health of Minnesota, has been in Winnipeg recently gathering some statistics regarding the health of that city.

Special Report Regarding Tuberculosis in Montreal.—Last June, Dr. de Martigny, Montreal, was sent to Paris by the hygienic committee of Montreal to study the Marmorek system of curing consumption. After some months of work, he has returned to Montreal and states in his report that he is thoroughly convinced of the wonderful efficacy of this serum, and feels positive that if the treatment were applied to the consumptives of Montreal that in ten years tuberculosis would be as rare in that city as smallpox.

Some Reminiscences of the Toronto General Hospital.—Dr. Charles O'Reilly, medical superintendent of the Toronto General Hospital, was appointed to that office in 1876, and has ever since filled the position in an able manner. During his administration there have been 4,000 births in the institution, and the number of patients admitted annually has increased from 972 in 1876 to 3,811 in 1904. During that time Dr. O'Reilly has supervised the training of 220 house surgeons, some of whom have since gained wide distinction in the ranks of medicine.

Hospital News.—Dr. A. M. Campbell has been appointed medical superintendent of the Winnipeg General Hospital. The number of patients treated in this institution during January, 1905, was 593; the number of deaths 40.——The number of patients treated in the Dauphin, Man., General Hospital, during 1904, was 334; 247 males and 87 females. The death rate was 3.8 per cent.——On February 14, the addition to the Woodstock, Ont., hospital was formally opened. The new operating room is said to be one of the finest in Canada.——The annual meeting of the Vancouver, B. C., General Hospital was held February 8, and Dr. A. M. Robertson, the general superintendent, reported that 851 patients were admitted to the wards during 1904; 785 were discharged, and 58 remained. The deaths numbered 63.

Personal.—Dr. Oskar Klotz has resigned from the governor's fellowship in pathology at McGill University. During the tenure of the fellowship by Dr. Klotz he has done much valuable research work. This fellowship is open to graduates in medicine who have done some research work, is tenable for two years and is worth $500 per annum.——Dr. R. A. Pyne, for many years registrar of the College of Physicians and Surgeons of Ontario, has been admitted to the Whitney cabinet as minister of education.——Drs. Walter Maybury and E. H. Adams, Toronto, who have been in Jamaica studying the climate, have returned to Toronto.——Dr. T. G. Roddick, dean of the medical faculty of McGill University, is spending a vacation in the Bahama Islands.——Prof. J. George Adami of McGill University, has been elected chairman of the board of management of the Montreal League for the Prevention of Tuberculosis to succeed Dr. Roddick, who has resigned.——Dr. H. B. Cameron of Atlin, B. C., has returned from a visit in Honolulu.——Dr. J. O. Reaume, Windsor, Ont., has been appointed minister of public works of that province.

FOREIGN.

Medal in Honor of a French Victim to Professional Duty.—The Paris Mint has just struck off a medal in honor of Dr. B. Teissier, who died at the age of 23 from the consequences of an official medical mission to Egypt. The design for the medal is the work of Dr. P. Richer, the artist-physician of Paris, and interweaves the dates, 1880-1903, with the outlines of the pyramids.

Physicians In the French Cabinet.—The new French Cabinet contains two physicians, Dr. A. E. Gauthier, who is at the head of the department of public works which includes railroads, etc., and Dr. J. Dubief, minister of commerce. The latter was chief of the Marseilles Insane Asylum, 1886-1893, and then of the Rhone Asylum until elected deputy a year or so later. He has been a member of the Committee on Labor since 1902. The under-secretary of finance is also a physician, Dr. Merlou, who has served as deputy since 1889.

Consultations Concerning Infants.—Vienna has opened a small establishment where mothers can bring their infants for inspection and advice. It is similar to the *Consultations de Nourissons*, which have done such good service in Paris and in other French towns. Printed circulars and pure milk are

given to the mothers, and the infant is weighed and inspected generally at each visit. The consultation is intended only for healthy infants, and is founded in the hope to keep the infants healthy by intelligent supervision. A physician is in attendance every morning.

Campaign Against Tuberculosis in Switzerland.—Under the presidency of Dr. Schmidt, director of sanitation at Berne, a reunion of delegates of the various Swiss Cantons was held at Olden for the purpose of discussing measures for combating tuberculosis. The *Public Health Reports* state that a general program was approved having for its object the instruction of the people regarding the means of diffusion of tuberculosis and of defense against the disease. Legislative measures recommended for adoption by the government of Switzerland were outlined, and a committee was appointed to represent Switzerland at the International Tuberculosis Congress to be held at Paris, October, 1905.

Some Ethical Questions In Germany.—The Medical Society of Salzburg, Germany, has tried in every way to put an end to the unlimited advertising in the local papers of dentists in adjacent towns. The local dentists were under ethical restrictions not to advertise, and the outsiders were the only ones known to the general public. Under these conditions the medical society voted to remove the restrictions to the advertising of their dental colleagues. The same body was recently warned by the authorities, *à propos* of a certain occurrence, that any physician who referred a patient to a layman for venesection or for any similar procedure, rendered himself liable to prosecution for co-operating in irregular practices.

Suit for Publishing Facts on Atavism.—A Paris publisher, Jouve, has been sued for $20,000 damages for selling to a layman a copy of a graduation thesis by Cousin of Paris, entitled "The Impregnation of the Mother," which discussed the subject of indirect atavism. Soon after the pamphlet appeared, a young man of Ardennes wrote for a copy of the pamphlet. The publisher refused to sell him a copy at first, but finally yielded to his urgent request and mailed to his unknown customer a copy of the thesis. After reading it the young man broke his engagement with his fiancée, a widow, under the pretext that he did not wish to risk having offspring which might resemble the woman's first husband. Hence the damage suit brought by the widow against the publisher of the thesis, holding him responsible for the rupture. The *Progrès Médical* gives the above details without comment in a recent issue.

Municipal Contract Practice.—An item has been going the rounds of the lay and medical press to the effect that the experiment of socializing medical attendance had been inaugurated at Zurich, Switzerland. Each taxpayer was to pay an additional dollar or less a year, and forty physicians were to be appointed by the city, at a salary of $2,500, to care for all the sick. Many editorials have been written on this news, which was generally qualified as "important if true," but our Swiss exchanges have never referred to the matter, and it has never been mentioned in the letters from correspondents at Zurich. Direct inquiry, we learn, has elicited that the item has no foundation. It was first launched in an obscure German journal and was copied in the dailies, whence it found its way into the medical press. Zurich has made no change in its present system of city physician, school inspector and his assistant, these three physicians devoting their attention to matters of hygiene and not practicing.

Prizes for Anti-Alcohol Literature.—In Germany there is a total abstinence society among physicians which gives prizes every year for the best anti-alcohol work presented. The theme in 1903 was "Influence of Alcohol on the Heart of Warm-Blooded Animals." The article which won the prize was written by M. Kochman of Ghent, and the committee regard the research on which it is based as representing a decided progress in our knowledge of the action of alcohol on the heart. Another work presented by O. Loeb of Heidelberg was also deemed so fine that a second prize was raised and presented to him. The theme for the current year is "Influence of Very Small Amounts of Alcohol on the Functions of Mind and Senses." Especial attention should be paid to the differences in sensation and the threshold values, under alcohol. The judges are Kraepelin of Munich, Grützner of Tübingen and Aschaffenburg of Cologne. The competing articles should be sent to Dr. G. Keferstein at Lüneburg before April 1, 1906.

Honors to a Spanish Physician.—A Madrid exchange, the *Siglo Medico*, relates in a recent issue that the community of Villamartin de Campos recently had a celebration in honor of the local physician, R. Fernandez y Rodriguez. He had served for twenty-four years as "medico titular," and in token of gratitude for his innumerable and important services, the town changed the name of one of its principal streets to name it after him. December 14 the authorities of the entire township and others gathered in this street and officially fastened in place the plates bearing the new name of the street. The procession then adjourned to the town hall, where four appreciative discourses were made, and Dr. Fernandez was officially declared the "adopted son" of the town. He replied personally to each of the four speakers. The *Siglo Medico* remarks that this simple and touching ceremony does honor both to the physician and to the town which conceived and carried it into execution.

LONDON LETTER.

Premature Burial.

The subject of premature burial has been much discussed in the papers in consequence of the following gruesome occurrence: A married woman, aged 28, was believed to be dead, and her body clad only in a nightdress and covered by a sheet was laid out in a cold room in the usual way. Six hours later the undertaker, while measuring her for her coffin observed a twitching movement of the eyelids and resorted to artificial respiration, with the result that the woman was resuscitated, and ultimately recovered. Of the fact that the woman was believed to be dead there is ample proof. Funeral coaches were ordered, an insurance company was notified, and a physician's certificate was obtained. The woman's history throws some light on the case. She had been ill for a long time, and for several weeks had been confined to bed. She had taken but little food, and had been subjected to the depressing influence of cold. There also appears to have been a predisposition to the cataleptic state, as twice before, once when an infant, and again at the age of 15, she was said to have lain as if dead. The danger of premature burial has taken strong hold of the minds of certain persons who order in their wills that a vein shall be opened by a physician after death or that their bodies shall be kept for a certain period before burial. A society for the prevention of premature burial was founded in London eight years ago, and has just held its annual meeting, at which Dr. Walter Hadwen delivered an address, entitled "The Need of Legislation Concerning Burial Reform." He said that the idea of premature burial is in no way mythical; it is a fact that many persons have been rescued from the tomb at the last moment. Physicians should be held responsible for the certificates which they give, and waiting mortuaries, like those in Germany, should be established to prevent any possible mistake. A resolution was passed urging the importance of impressing the subject on members of Parliament.

Medical Research in Egypt.

The Records of the Egyptian Government School of Medicine, vol. ii, recently published, contain important contributions to tropical medicine. The three scourges of Egypt are malaria, ankylostoma, and bilharzia. The last is accountable for a large proportion of the surgical cases, 16 per cent. of the in-patients at the hospital of the school suffering directly from lesions produced by this parasite, and, according to the pathologic report by Dr. Symmers, 7 per cent. of the deaths are directly due to it. In 100 consecutive admissions to the medical wards 35 patients were found to have the eggs in their urine, although only 2 of these were suffering in any way from the infection. At one period or other of life practically the whole native population is infected. Dr. Philips contributes an interesting article on the relation of malaria to ascites. In at least a third of the cases of ascites no cause other than malaria could be found, but the connection was not clearly established. A definite malarial cirrhosis of the liver occurred in a certain number of cases. Dr. Wilson follows up his observations on the poisons of spiders by an interesting study of the venom of Egyptian scorpions. By treating an aqueous extract of the poison gland with excess of alcohol he obtained a precipitate, from which he extracted with normal saline solution a very toxic substance. Its toxic value was ten millions, that is a milligram will kill 10 kilograms of guinea-pig. A full-grown specimen of the common Egyptian species (*Buthus quinque-striatus*) contains about 3½ milligrams of this toxin. If the susceptibility of man is the same as that of laboratory animals it follows that a single sting will kill at most 35 kilograms. This calculation corresponds with the fact that fatal cases of scorpion sting in adults are very rare, though the mortality in young children reaches 60 per cent. The report also shows that the incidence and distri-

bution of phthisis in Egypt do not differ from those of European countries.

Visit of British Physicians and Surgeons to Paris.

Arrangements are being made for a party of British physicians to visit Paris to inspect the laboratories, hospitals, and teaching institutions. The French physicians, who recently visited London, at that time expressed the hope of receiving a return visit in the near future. For this purpose, a committee was formed in Paris, with Professor Bouchard as president, and M. Lucas-Championnière as vice-president, and in December Sir William Broadbent, president of the London executive committee, received a formal invitation. May 11-13 has been decided on as the most suitable time for the visit.

Conference on School Hygiene.

A conference on school hygiene was held in London, February 7-10, under the auspices of the Royal Sanitary Institute. This conference is intended to prepare for the International Congress on School Hygiene, which is to be held in London in 1907. The president's address was entitled "The Co-ordination of the Teaching of Hygiene." Other subjects considered were the physical and mental development of scholars, buildings, equipment and sanitary inspection of schools, and training of teachers and scholars in hygiene.

The Prevalence of Syphilis.

The inter-departmental committee on physical deterioration has taken a considerable amount of evidence on the prevalence of syphilis. Most of the witnesses, including Sir Alfred Cooper and Surgeon-General Taylor, agreed that it showed some decrease. Sir Victor Horsley, while stating that there are no available data to decide whether the prevalence of syphilis is greater or less than it was twenty years ago, was positive in stating that its virulence has diminished. He thought that, in order to prevent the spread of syphilis, the medical officers of infirmaries and hospitals should be given statutory powers to detain patients who entered suffering from this disease. Following the resolution adopted at the International Congress held at Brussels, the committee expressed the opinion that "the moment is ripe for a searching and exhaustive investigation into the extent of the malady and for a definite pronouncement on the steps which should be taken to arrest its progress and to trace and counteract its effects."

Cremation in Great Britain.

Though cremation is far from popular in Great Britain, it has made steady progress since the first crematorium was opened in Woking (near London) in 1885. In succession crematoriums have been opened in the following cities: Manchester, in 1892; Glasgow, in 1895; Liverpool, in 1896; Hull, in 1896, the first municipal crematorium; Darlington, in 1901; Leicester, municipal; Golder's Green (near London), Hampstead Heath, near London, in 1902; Birmingham, 1903; Leeds, 1904. In the present year two more will be opened, one by the City of London at Ilford, and the other at Bradford. The number of cremations performed in Great Britain since the establishment of the practice amounts to 4,407. The numbers for 1903 and 1904 were respectively 475 and 566. The success of the movement was largely due to the able and untiring advocacy of the late Sir Henry Thompson. The fact that it has made so little progress is due to theological objections and to the natural conservatism of the English people.

Correspondence.

The Red-Light Treatment of Smallpox.

NEW YORK CITY, Feb. 15, 1905.

To the Editor:—Your editorial comment (February 11, page 477) on the so-called red-light treatment of smallpox is eminently sound and just. In Dr. Schamberg's original article he stated that he used "ruby-colored" glass, but failed to state that he had tested the same for actinism either spectroscopically or photographically. The old style of genuine pot-metal ruby is, I believe, no longer to be found in trade—at least I have not succeeded in getting any, even from sources that supplied me some years ago. All of the so-called ruby glass that I have examined admits an abundance of actinic light, running up even to the blue of the spectrum. The negative experiences of Dr. Schamberg, therefore, have no weight with me and I much prefer to rely on the positive evidence afforded by Finsen and others. The idea, however, of excluding light in the treatment of smallpox is by no means new, as when I had charge of the smallpox hospital in Blackwell's Island in 1864 it was the custom to cover the lesions thickly with mercurial ointment with the express purpose of excluding the light.

H. G. PIFFARD.

Indoor Humidity.

BROOKLYN, Feb. 14, 1905.

To the Editor:—Since the publication of my paper on "Indoor Humidity," which you were good enough to review in the columns of THE JOURNAL, a firm engaged in the manufacture of a well-known and widely advertised disinfectant, namely, "Platt's Chlorides," has, without my permission, and much to my annoyance, used my name and extracts from my paper in its advertisements. The omission of quotation marks and the clever wording make me appear responsible for recommending that preparation in connection with humidification. I wish to disclaim all responsibility for the use this firm has seen fit to make of the material contained in my paper. I have requested them to discontinue all such references.

HENRY MITCHELL SMITH.

Queries and Minor Notes.

ANONYMOUS COMMUNICATIONS will not be noticed. Queries for this column must be accompanied by the writer's name and address, but the request of the writer not to publish his name will be faithfully observed.

FIGHTING MEDICAL FRAUDS.

MONA, W. VA., Feb. 14, 1905.

To the Editor:—1. In your editorial on "Fighting Medical Frauds" mention is made of the press committees of the Germans, and that it would be commendable for our county societies to follow in their path. I have felt for some time that much should be done for the education of the public in medical matters. I would be under obligations if you would indicate to me where I could secure an outline of the work of such above committee. 2. Has a county society the right to establish a minimum or average fee-bill for its use, at least as a standard for minimum charges? 3. Would our society be within its rights and privileges in preparing a list of those who can pay and will not? I see in some of my journals that some such action has been taken by some county societies.

F. T. H.

ANSWER.—1. You will find a long account of the German method of fighting medical frauds in THE JOURNAL, May 28, 1904, p. 1435, and Feb. 4, 1905, p. 403. 2. Yes. While Section 3, of Chapter II, of the Standard Constitution and By-Laws for County Societies says: "Agreements and schedules of fees shall not be made by this society," it must be understood that this and several other provisions are suggestive and not fundamental. Many excellent societies have adopted schedules of fees and we see no objection to it. 3. Yes, if it is managed with care so as to avoid doing injustice to the worthy poor or to public health, and if the principle is not carried to extremes. It must be recognized that there are those in some communities who can pay but who will not pay either their physician or others. The butcher and the baker demand pay in advance from these and get it. The medical man can not do this always, and yet nothing is more aggravating to a physician than to give his time and his knowledge, often at great personal sacrifice, knowing that he will get nothing for it, simply because the individual he is aiding is too unprincipled or too dishonest to pay. There certainly is an excuse to make provisions that will bring such persons to time. Hence a blacklist, while contrary to the high ideals of physicians, is sometimes almost a necessity. It is a provision, however, that can work a reflection on the profession, and one which can be abused. Under no circumstances should one be placed on the list who would pay if he could; only the real deadbeats should be found there, and there are usually few of these in a community.

LIQUOR STIBII COMPOSITUS.

SHEBOYGAN, WIS., Feb. 14, 1905.

To the Editor:—Please let me know the composition and strength of the German liquor stibii comp. This is referred to in Hyde's "Diseases of the Skin." The solution is employed by Unna in the thorn treatment of lupus nodules.

A. G.

ANSWER.—Dr. Hyde informs us that the formula for the liquor stibii comp. is published in Dieterich's Manual (eighth edition) under the name of liquor stibii chlorati. It is prepared as follows: Antimony sulphid (pure black antimony) is digested with five times its weight of HCl in a flask until reaction ceases. The solution is filtered through glass wool and placed in a glass retort on a sand bath, from which about one-half is distilled off and rejected. The residue is then distilled into a receiver containing an equal weight of distilled water so long as the distillate produces turbidity. This distillate is set aside for several days and the supernatant liquid decanted and mixed with sufficient dilute HCl to give the liquor a sp. gr. of from 1,345 to 1,360. The solution appears to be similar to the solution of chlorid of antimony, known in this country under the commercial name of butter of antimony.

ANTISEPTIC MOUTH WASHES.

ALBUQUERQUE, N. M., Feb. 17, 1905.

To the Editor:—Can you suggest a good, reliable aseptic mouth wash that is not a patent medicine and which can be prepared in quantity at a minimum expense? W. H. BURR.

ANSWER.—The following may be used:

Quillaja, in coarse powder	3xi	35
Cochineal, in powder	gr. xv	1
Glycerin	fl. 3iii	90
Oil of gaultheria	gtt. xxv	1
Alcohol	fl. 3x	300
Peppermint water q. s. to make	fl. 3xxxii	960

Macerate the quillaja with the alcohol and 12 fluid ounces (360) of peppermint water for several days; add the cochineal, glycerin and oil of gaultheria, let stand for one more day, shaking occasionally, then filter, adding the remainder of the peppermint water, through the filter to make 32 fluid ounces (960 c.c.).

Another formula is a eucalyptus mouth wash:

Eucalyptol	fl. 3v	20
Menthol	3v	20
Oil of cloves	m. lxxx	5
Oil of gaultheria	m. xvi	1
Heliotropin	gr. lss	1
Acetic ether	fl. 3iii	10
Alcohol	fl. 3xxx	900
Water q. s. to make	fl. 3xxxiv	1000

Castile soap may be used instead of quillaja in the first formula given.

Marriages.

OTTO C. GAUB, M.D., to Miss Claudia Hax, both of Pittsburg, Pa., February 23.

JOHN E. HAMPTON, M.D., to Miss Emma Cogdill, both of Asheville, N. C., February 7.

WILLIAM H. DAVIS, M.D., to Miss Flora C. Fuhs, both of Brooklyn, N. Y., February 1.

CHARLES A. O'REILLY, M.D., Philadelphia, to Miss Kate Sproull of Rome, Ga., February 11.

CYRUS M. HARRIS, M.D., Bourbon, Ind., to Miss Mary Remola Yanaway of Casey, Ill., February 7.

ROBERT MILTON TALIAFERRO, M.D., to Miss Rebecca Morton, both of Lynchburg, Va., February 15.

JOSEPH COLLINS, M.D., New York City, to Miss Edith Davies of Gordon Square, London, February 7.

FRANCIS MURRAY PHILLIPS, M.D., to Miss Harriet Twyford Bagwell, both of Baltimore, February 15.

EDWARD JENNINGS CLARK, M.D., to Miss Grace Edith Tunstead, both of Minneapolis, Minn., February 22.

THOMAS WILLIAMS NAVE, M.D., to Miss Clemence Marie Tacquard, both of Galveston, Texas, February 15.

ARTHUR LAWRENCE HOLLAND, M.D., New York City, to Mrs. Ethel DeMitkiewitz of Cambridge, Md., February 15.

HARRY W. HOWLAND, M.D., Keeneyville, Pa., to Miss Helen P. Gaddis of Baltimore, at Wilmington, Del., June 30, 1903.

Deaths.

William Nichols Platt, M.D. University of Vermont Medical Department, Burlington, 1870, prominent as a practitioner in Addison County, Vt.; senator from that district in 1894; representative in the legislature from Shoreham in 1892; for a long time trustee of the Vermont State Hospital for the Insane; a member of the American Medical Association, Vermont State Medical Society and Addison County Medical Society, died at his home in Shoreham, Vt., Nov. 14, 1904, from cerebral hemorrhage, after an illness of a year and a half, aged 55.

Samuel J. S. Rogers, M.D. Berkshire Medical College, Pittsfield, Mass., 1847, for nearly 55 years a practitioner of California; county physician of Yuba County for two years; city councilman of Marysville for two terms; a member of the American Medical Association, Medical Society of the State of California, California Northern District Medical Society and the Medical Society of Yuba and Sutter counties, died at his home in North Bloomfield, Cal., Nov. 7, 1904, from senile debility, aged 80.

Alexander Ramsay, M.D. Medico-Chirurgical College of Philadelphia, 1892, a member of the American Medical Association; formerly a policeman assigned to duty at Philadelphia Hospital; then a medical student, and later superintendent of the Medico-Chirurgical Hospital; one of the most successful practitioners of Kensington, Philadelphia, died at his home in that city, February 11, from pneumonia, aged 54.

Thomas H. Sherwood, M.D. Department of Medicine of the University of Pennsylvania, Philadelphia, 1858; assistant surgeon of the Third and Twenty-seventh Pennsylvania Volunteer Cavalry in the Civil War; for many years a medical referee in the U. S. Pension Office, Washington, died at his home in that city, February 9, from heart disease, aged 71.

Albert A. Johnston, M.D. University of Louisville Medical Department, 1856; surgeon in the Confederate service during the Civil War; for several years president of the Dallas County Medical Society, and a member of the State Medical Association of Texas, died at his home in Dallas, February 10, after an illness of two days, aged 70.

William E. Bessey, M.D. McGill University Medical Department, Montreal, 1863, a member of the American Medical Association and of the British Medical Association; one of the oldest practitioners of Grand Rapids, Mich., died at St. Mary's Hospital in that city, February 15, after an illness of several weeks, from a carbuncle, aged 87.

William H. Heath, M.D. Starling Medical College, Columbus, Ohio, 1852, of Scranton, Pa., a veteran of the Mexican War, died at Lackawanna Hospital, Scranton, February 8, two weeks after an accidental fall on the ice by which he suffered a fracture of the skull, aged more than 80.

Frank Cowan, M.D. University of Georgetown Medical Department, Washington, D. C., 1869, physician, lawyer, journalist, traveler, lecturer, poet and author, died at his home in Greensburg, Pa., February 12, after an illness of several months, aged 60.

Frank Raymond Young, M.D. Department of Medicine of the University of Pennsylvania, Philadelphia, 1899, of Smethport, Pa., a member of the American Medical Association, McKean County Medical Society, and Smethport Board of Health, died May 23, 1904.

John A. Hall, M.D. Jefferson Medical College, Philadelphia, 1859, formerly of Knobnoster and Nevada, Mo., died at the home of his daughter in Lamonte, Mo., February 6, from cerebral hemorrhage, after an invalidism of several years, aged 73.

Timothy Melville Lippitt, M.D. Starling Medical College, Columbus, Ohio, 1897, died at his home in Columbus, February 10, from long-standing disease of the throat, for which recent operation had given only temporary relief, aged 32.

John A. Henry, M.D. New York University, New York City, 1890, formerly assistant health commissioner of Denver, died at St. Joseph's Hospital, Denver, January 23, from tuberculosis, after an illness of several years, aged 40.

John D. Butler, M.D. Department of Medicine of the University of Pennsylvania, Philadelphia, 1841, formerly a member of the legislature, died at his home near Sparta, Va., February 9, after an illness of several weeks, aged 86.

Joseph Haas, M.D. Jefferson Medical College, Philadelphia, 1850, of Mahanoy, Pa., for 55 years a practitioner of the Mahanoy Valley, died suddenly in his sleigh while making a professional call, January 27, aged 75.

John Beale Howard Gittings, M.D. Department of Medicine of the University of Pennsylvania, Philadelphia, 1863, died at his home in Philadelphia from lobar pneumonia, February 9, after an illness of five days, aged 67.

John W. Goodwin, M.D., formerly of Greenup, Ill., treasurer of Cumberland County, Ill., and of Pomona, Cal., died, January 27, at his home in Los Angeles, Cal., after an illness of three months, from heart disease.

Harry Lester Small, M.D. Medical School of Maine at Bowdoin College, Brunswick, 1904, died at his home in Burnham, Maine, Dec. 26, 1904, from typhoid fever, after an illness of twelve days, aged 32.

John Sappington, M.D. Jefferson Medical College, Philadelphia, 1868, senator from Harford County from 1886 to 1888, died at his home in Darlington, Md., February 10, from cerebral hemorrhage, aged 56.

John Rockwell McLelland, M.D. College of Physicians and Surgeons, Baltimore, 1873, representative in the state legislature in 1892 and 1896, died at his home in Mooresville, N. C., January 30, aged 54.

Sydney E. Tiner, M.D. Faculty of Medicine of Queen's University, Kingston, Ont., 1904, of Kingston, died in the Orthopedic Hospital, New York City, February 14, from spinal meningitis, aged 25.

William P. Chapman, M.D. University of Nashville (Tenn.) Medical Department, 1860, died at his home in Woodville, Texas, February 10, after an illness of several months, aged 68.

H. S. Goodwin, M.D., of Sedalia, Mo., assistant surgeon in the Army in the Philippine Islands for three years, died in the University Hospital, Kansas City, Mo., Nov. 3, 1904, aged 35.

Samuel Jay Mills, M.D., of Toledo, assistant surgeon in the Army during the Civil War, died in the Lucas County Infirmary, Toledo, February 2, after an illness of a week, aged 71.

Joseph T. Sloan, M.D. University of Nashville (Tenn.) Medical Department, 1861, died at his home in Tehuacana, Texas, from influenza, February 9, after a short illness, aged 64.

John A. Vixtrum, M.D. Vanderbilt University Medical Department, Nashville, Tenn., 1883, of Princeton, Ill., died from tuberculosis at Colorado Springs, Colo., February 9.

Robert A. Ellis, M.D. Tulane University of Louisiana Medical Department, New Orleans, 1871, died at his home in Hot Springs, Ark., February 11, after a long illness.

Ava M. Carroll, M.D. University of Buffalo (N. Y.) Medical Department, 1888, died at her home in Niobe, near Jamestown, N. Y., February 9, after a long illness, aged 48.

Waitman W. Morgan, M.D. College of Physicians and Surgeons, Baltimore, 1883, died at his home in Mingo Junction, Ohio, February 14, from pneumonia, aged 49.

Charles Walter Wilkerson, M.D. Tulane University of Louisiana Medical Department, New Orleans, 1898, died at his home in Montgomery, Ala., February 9, aged 39.

Francis Anson Evans, M.D. St. Louis, 1877, poet and journalist, died at his home in Tell City, Ind., February 9, after an illness of more than a year, aged 51.

Cuthbert Bullitt, M.D. Kentucky School of Medicine, Louisville, 1859; veteran of the Mexican and Civil wars, died at San Antonio, Texas, February 11, aged 83.

Thomas F. Padula, M.D. Harvard University Medical School, Boston, 1887, died suddenly at his home in Quincy, Mass., February 9, from heart disease, aged 45.

Samuel B. Smith, M.D. University of Nashville (Tenn.) Medical Department, 1882, died suddenly from heart disease at his home in Naples, Texas, February 10.

Peter Roosevelt Johnson, M.D. College of Physicians and Surgeons in the City of New York, died at his home in Sag Harbor, L. I., February 13, aged 76.

William W. Leggett, M.D. Tulane University of Louisiana Medical Department, New Orleans, 1859, of Lamar, Ark., died recently in Danville, Ark.

James R. Bracken, M.D. Cincinnati, 1852, died at his home in Warren, Ohio, February 14, after an illness of five days, from influenza, aged 79.

DeWitt Clinton Senter, M.D. Vanderbilt University Medical Department, Nashville, 1886, died suddenly in Middleboro, Ky., February 15.

Elliott Detchon, M.D. Cleveland Medical College, 1851, died at his home in Crawfordsville, Ind., January 29, after a short illness, aged 76.

Richard Joseph Nagle, M.D. College of Physicians and Surgeons of Chicago, 1895, died at his home in Dixon, Ill., February 12, aged 39.

Thomas Moore, M.D. King's College, London, England, 1845, died at his home in Indianapolis, February 8, from senile debility, aged 83.

Joseph H. Lawrence, M.D. University of Louisville Medical Department, 1894, died suddenly in a bank at Hyden, Ky., February 8.

John H. Gale, M.D., Illinois, 1893, of Chicago, died at the Chicago Union Hospital February 18, from heart disease, aged 68.

J. N. Ridley, M.D. Atlanta (Ga.) Medical College, 1880, died at his home in Warwick, Ga., February 8, after a lingering illness.

H. H. McLendon, M.D. Louisville Medical College, 1886, of Floyd, Texas, died, February 8, at Greenville, Texas, aged 40.

J. C. Crandall, M.D., Minnesota, died suddenly at his home in Witoka, Minn., February 14, from senile debility, aged 81.

Samuel J. Hole, M.D., Examination, 1855, died at his home in Hanoverton, Ohio, February 13, aged 75.

George Keeslar, M.D. County License, 1897, died at his home in Orland, Ind., February 2, aged 75.

William B. Jones, M.D. Kansas City, Mo., died at his home in Galena, Kan., February 3.

Miscellany.

The Oldest Medical Works and Prescriptions.—The oldest medical works in existence are those of the Chinese, and date back to nearly 3,000 years B. C., says the *Practical Druggist.* Then, as now, they divided their subjects under the captions of healing, cooling, refreshing and temperate. They have everything divided into classes, and their prescriptions are classified under seven headings, as follows: (1) The great prescription; (2) the little prescription; (3) the slow prescription; (4) the quick prescription; (5) the odd prescription; (6) the even prescription; (7) the double prescription. These are applied under four special circumstances and conditions, which in turn are classified. Fire is an agent in which they have great faith, as also they have in mineral waters.

How to Succeed in Medicine.—The following has been prescribed to insure success in the practice of medicine, and long years of experience have fully demonstrated that the formula may safely be given the highest degree of confidence, says the *Clinical Review:*

Be enthusiastic about your work.
Be sympathetic with the sick.
Be pleasant and agreeable.
Have confidence in yourself.
Exercise good business tact.
Beware of ruts, and
Remain a life long student.

The editor adds a further injunction which he thinks merits the dignity of being at least second in the list. That is: Be divinely patient at all times.

Evils of Contract Practice.—A good illustration of the evils of the so-called club, or contract practice, according to the *Clinical Review,* was recently mentioned by a physician resident in a neighborhood where such a degrading state of things exists. It appears that in a talk with one of the laity, who clearly had a keen sense of comparison, this physician was told by the layman that his "family could get doctored cheaper than he could get shaved." And in explanation it was brought out that the workman paid a dollar per month to his barber, for which a ticket was given entitling him to three shaves a week and one hair cut a month. On the other hand, he paid 75 cents per month to the contract doctor, and in return received for himself and entire family all needed medical attention and medicine.

Botryomycosis.—The following are, in brief, the conclusions of a paper by V. Ball of Lyons, based on experimental work in regard to this disease of animals which has been recognized also in the human species. His article was published in *Archives Gén. de Méd.* cxciv, No. 31, 1904. Botryomycosis is purely a microbic disorder due to a special staphylococcus. The tumors are *sui generis,* thus suggesting a specific agent in their causation. Botryomycoses appear only tardily in the tumors. The muriform masses in the horse appear to be of cellular structure. The ball-like formations (boules) are the result of botryosic degeneration. The term botryomycosis is incor-

rect, as the disease is not a mycosis. He agrees with Poncet and Dor that there occurs in man an affection which, from an anatomic and bacteriologic point of view, affords a close analogy with the animal disorder.

Disposal of Dejecta in Small Communities.—Dr. Seneca Egbert, in the *Medico-Chirurgical Journal*, mentions the widespread influence for harm of the domestic privy-vault or cesspool in villages and small communities throughout the country. He condemns the "fatuous blindness" of the home-builder who, for convenience sake, locates both the privy and the well near the dwelling and, therefore, near each other. He states that too often the physician himself fails to note the obvious source of the disease which he is treating. Dr. Egbert says that doing away with the privy will not immediately remove the harmful influence from the water supply, as the soil is saturated, and that a new and unpolluted water supply must be secured before the improvement for sewage and disposal of excrement is begun. He calls attention to the fact that in communities without a good water supply the cost of a single epidemic of typhoid or similar disease often far exceeds the expenditure necessary for the purchase or lease of reservoirs, dams, mains, etc.

How to Make the Society Meeting Valuable.—Not more than one society paper out of ten is suitable for the columns of a live medical journal. The other nine are usually compiled articles rehashed from text-book research, according to the editor of the *Medical Council*.. The article which is really worth publishing deals with the author's own experience, either involving points that have not been published before in journals or books, or specially emphasizing some point not well known, or exposing some mistake common in our present practice or literature. If this idea were kept in view in preparing society articles, our medical society meetings would all be worth attending. They generally are any way—on account of the good fellowship promoted, if not on account of the value of papers read. A paper two minutes in length showing some practical point is of more value than the average compiled article of a half-hour to an hour's length. Make a resolution to give your hearers something they can not get in text-books or not to read a paper at all.

Fresh Eggs.—The question of convenient transportation and prompt delivery is not so important in the case of eggs as of milk, but it is nevertheless worth considering. The *Scientific American* describes a tray-like metal holder in which one dozen eggs are retained by projecting spring-like rings. In transportation the eggs are kept from being broken far more successfully than by the old pasteboard method. The eggs placed in the holder by the farmer need not be removed until they reach the consumer; for example, they may be examined by holding the entire dozen in the holder to the light, and the package can be placed in a refrigerator or placed entire in water for cooking. To assure the quality, a strip label may be placed across each row of eggs so that the eggs can not be removed without destroying the label. This label may be dated, instead of the method now sometimes employed of using a rubber dating stamp on each egg. This will aid in providing "morning eggs" for infants and invalids. The method seems to have much to commend it, especially to those who do not relish the common store eggs which "ought only to be scrambled."

Immigration in Canada from the Medical Standpoint.—Dr. J. M. Aumont addressed the last Congress of French-Speaking Physicians on the above subject, declaring that Canada is the dumping-ground of all the immigrants rejected by other countries. The consequences are that the hospitals are filled with imported sick, the country is infested with the contagious diseases of Europe, and the prisons are crowded with the criminals that have escaped their just deserts elsewhere. He urges legislation to insure more careful medical inspection of immigrants, and measures to attract desirable immigrants. The Canadian government spent only $494,842 in 1902 and $642,913 in 1903 for the latter purpose, while the quarantine and public-health service was allowed $144,074 and the veterinary service $106,529. During the year 1903, 128,365 immigrants entered Canada, and of the 31,383 settling in western Canada only 899 were Canadians returning from the United States. He applied recently to the immigration bureau for a housemaid. The first sent to him, just arrived, was consumptive; the second had trachoma. Both were from England. He wrote up the matter in the lay press and the immigration bureau replied, denying the facts, and absolutely refused to send him another maid at his further requests.

A Sign of Death.—In commenting on premature burial the *British Medical Journal* states that the horrors of the accident are probably more imaginary than real. If a person in a state of trance were to be buried while life still persisted in a latent state, it is scarcely conceivable that the victim could awake; the unconsciousness of catalepsy would simply deepen until it became fixed in the dreamless sleep of death. The danger of premature burial is, of course, greatest in time of epidemic, when the disposal of the dead becomes a matter of urgency, and the risk of infection may conceivably cause undue haste in the verification of the fact of death. The test recently published by Icard,[1] and claimed by him to furnish absolute proof of death, is referred to. After the injection of a solution of fluorescin deeply into the cellular tissue, if circulation still goes on, intense jaundice of the skin and mucous membranes follows the absorption of that substance, whilst the eye becomes green "like an emerald set in the orbit," to use the author's phrase. If the circulation has completely stopped nothing of the kind is seen. When, therefore, after some time has elapsed from the time of the injection, none of these phenomena of coloration are seen, it may safely be concluded that death has occurred. A return to life would be manifested by renewal of circulation, and this would automatically be followed by yellow staining of the skin and green coloration of the eye. In time of epidemic Dr. Icard thinks it would be expedient, at least two hours before a body is placed in the coffin, to make a subcutaneous injection of fluorescin. If the person is dead this causes no disfigurement; if he is alive only a transient discoloration is produced.

The Sunflower Vice.—A peculiar indulgence of the Russian peasant, noted by Marcou in *Archives Generales de Médicine*, is the habit of eating sunflower seeds, which is almost universal among the lower classes of that country, and which is credited by him as responsible for the propagation of infections to a very serious extent. The seed, which has an oily kernel of a rather agreeable taste, has a harder envelope, which is split by the teeth and which is expectorated in the streets, public conveyances, places of amusement, etc. Covered with saliva, it carries whatever germs may exist in the mouth and quickly drying puts them in a condition for doing the most harm. He found, by actual examination of samples collected, that most of these ensalivated husks were rich in pathogenic germs. In nearly all staphylococci were found, very frequently streptococci, in twenty cases Koch's bacilli, and in ten the bacillus of diphtheria. The universality of the habit is very noticeable, and he reports that the empress, recognizing this little indulgence, has had sent to the army in Manchuria $150,000 (the article says 800,000 francs) worth of these seeds to encourage the soldiers in their arduous campaign. Sunflower seed seems comparatively innocent. The fact that its usage has become so widespread as this French author reports is significant and suggests that there must be something more than a mere gustatory gratification in the indulgence. When asked why they so indulged, the answer of the users was always the same: It does not especially nourish; it even makes the mouth sore after a time, but it occupies the attention and distracts from other matters. In its way, Marcou says, it is a veritable minor social scourge and one pathologic factor to be added to the numerous others that exist in the Russian empire.

1. Ann. d'Hygiene Publique et de Méd. Lég., October, 1904.

State Boards of Registration.

COMING EXAMINATIONS.

Connecticut Medical Examining Board, City Hall, New Haven, March 14-15. Secretary, Charles A. Tuttle, M.D., New Haven.

Massachusetts Board of Registration in Medicine, State House, Boston, March 14-15. Secretary, Edwin B. Harvey, M.D., Boston.

Maine Board of Medical Registration, City Building, Portland, March 28. Secretary, Wm. J. Maybury, M.D., Saco.

Examinations in Hawaii.—The Hawaiian Territorial Board of Medical Examiners has ruled that all examinations for license to practice medicine and surgery in the Territory of Hawaii shall be conducted in the English language; and that examinations shall be held four times a year, in January, April, July and October. These regulations went into effect Jan. 1, 1905.

Indiana January Report.—Dr. W. T. Gott, secretary of the State Board of Medical Registration and Examination reports the written examination held at Indianapolis, Jan. 10-12, 1905. The number of subjects examined in was 18; number of questions asked, 100; percentage reuired to pass, 75. The total number of applicants examined was 61, of whom 50 passed and 11 failed. The following colleges were represented:

PASSED. College.	Year Grad.	Per Cent.
Rush Medical College...(1903) 75.1, 87.2; (1904) 82.6, 83.5,		87.2
American Medical College, Missouri	(1904)	86.2
Eclectic Medical Institute, Cincinnati	(1904)	81.4
Miami Medical College	(1903)	88.5
Barnes Medical College	(1904)	84.8
Howard University	(1904)	75.5
Johns Hopkins Medical School	(1902)	86.7
Jenner Medical College	(1904)	82.1
Cornell Medical College	(1902)	90.6
Trinity University, Toronto	(1904)	80.9
Indiana Medical College	(1904) 75.2, 83.1,	83.3
Woman's Medical College, Pennsylvania	(1904)	82.3
Yale Medical School	(1900)	83.5
University Medical College	(1904)	77.9
Hosp. Coll. of Med., Kentucky	(1904) 75.8,	83.2
Southwestern Homeopathic Medical College	(1904)	85.1
Northwestern University. (1902) 86.8, (1903) 88.4,	(1904)	82.9
University of Michigan	(1902) 88.9, (1903)	78.7
Medical College of Ohio	(1902)	88.9
College of P. and S., Chicago, (1902) 75.5, 80.1; (1903) 85.4, (1904) 77.5, 80.1, 80.1, 83.4, 84.8, 80.		
Harvey Medical College	(1901)	78.7
Illinois Medical College	(1904) 79.1, 80, 81.1, 83.3,	84.1
Chicago Homeopathic Med. College...(1903) 78.2	(1904)	84.2
University of Hungary	(1894)	76
Louisville National Medical College	(1903)	75.9
University of Louisville	(1903)	79.6
Kentucky School of Medicine	(1904)	76.5
FAILED.		
Hospital College of Medicine	(1904) 48.5, 58.4, 62.7,	65.5
University of Louisville	(1891) 48.1, (1904)	67.5
Kentucky University	(1904)	64.3
Medical College of Indiana	(1904)	65.1
Eclectic Medical Institute, Cincinnati	(1903)	66.7
Kentucky School of Medicine	(1889)	52.5
Illinois Medical College	(1902)	57.8

New Mexico December Report.—Dr. B. D. Black, secretary of the New Mexico Board of Health, reports the oral and written examination held at Santa Fe, Dec. 5, 1904. Two persons were examined. A graduate of Vanderbilt University (1893) passed, and a graduate of the National Medical University, Chicago (1903), failed for the second time. Twenty-three applicants were licensed under the present law by registration of diplomas from schools in good standing.

North Dakota January Report.—Dr. H. M. Wheeler, secretary of the North Dakota State Medical Examining Board, reports the written examination held at Grand Forks, in January. The number of subjects examined in was 13; percentage required to pass, 75. The total number examined was 8, of whom 6 passed and two failed (Chicago Homeo. Med. Coll., 1895, and Hamline University, 1904, percentages not given). The following colleges were represented:

PASSED. College.	Year Grad.	Per Cent.
Hamline University	(1903)	80
Trinity University	(1902)	75
University of Minnesota	(——)	78
Rush Medical College	(1903)	86
Marion Sims-Beaumont Medical College	(1904)	77
Hahnemann Medical College, Chicago	(1904)	81

Rhode Island January Report.—Dr. Gardiner T. Swartz, secretary of the Rhode Island State Board of Health, reports the written examination held at Providence, Jan. 5-6, 1905. The number of subjects examined in was 7; total number of questions asked 70, percentage required to pass, 75. The total number examined was 5, all of whom passed. The following colleges were represented:

PASSED. College.	Year Grad.	Per Cent.
Baltimore University	(1904)	79.1
Tuft's Medical College	(1904)	82.8
Georgetown University	(1903)	80.6
College of P. and S., Boston	(1904)	80.4
College of P. and S., New York	(1899)	86.5

South Dakota January Report.—Dr. H. E. McNutt, secretary of the South Dakota Board of Medical Examiners, reports the written examination held at Aberdeen, Jan. 11 and 12, 1905. At each examination the number of subjects examined in was 12; total number of questions, 99; percentage required to pass, 75. The total number examined was 23, of whom 19 passed and 4 failed.

PASSED. College.	Year Grad	Per Cent.
Rush Medical College. (1882) 78.56, (1903) 84.33,	(1904)	78.16
College of P. and S., Chicago	(1902)	79.41
University of Iowa	(1897)	80.75
University of Minnesota	(1902) 84.5, (1904)	78.08
Hering Medical College, Chicago	(1904)	86.17
Chicago Homeopathic Medical College	(1904)	79
University of Pennsylvania	(1895)	82.08
Detroit College of Medicine	(1904)	76.75
University of Nebraska	(1904)	82.91
Hamline University	(1896) 75,* (1903)	84
Keokuk Medical College	(1903)	79.66
American College of Med. and Surg., Chicago	(1904)	83.58
Ohio Medical University	(1902)	82.16
Washington University	(1903)	83.33
University of Bishop's College, Montreal	(1902)	86.08
FAILED.		
Wisconsin College of Medicine	(1896)	35.25
Starling Medical College	(1903)	70.8
New York Medical University	(1890)	70.8*
Washington University	(1904)	71.8

*Second examination.

Association News.

THE PORTLAND SESSION.

Contracts Closed for the Main Auditorium and Rooms for All Sections Arranged Near.

The following announcements are made in the *Medical Sentinel* concerning the Portland session of the American Medical Association:

MEETING PLACES ARRANGED.

Contracts have now been made for a large auditorium and galleries for exhibitors in the Portland Exposition building; the central auditorium for the General Meetings will easily seat 3,000 people and has good acoustic properties. This is situated on three different car lines and has two others within two or three blocks. It is also in the center of the main school and academy district of the city, so that rooms for all the sections have been obtained within a radius of not to exceed six blocks from the central building.

This will provide abundant and comfortable accommodations for both the General Meetings and the different sections during their meetings in Portland. The Exposition building is within five or six minutes' walk of most of the leading hotels and is on a direct line from the center of the city to the Lewis and Clark Fair grounds. The two chief car lines to the fair grounds pass its doors.

ACCOMMODATIONS FOR ALL VISITORS ASSURED.

A large number of requests for accommodations have already been received and promptly responded to, and their wishes fulfilled by the bureau, of which Mr. H. C. Bowers has charge. The committee of arrangements again wish to urge all who are intending to come to the session to send in their requests for accommodations at an early date. A number of new, smaller hotels are going up all over the city, the boarding schools and academies are being converted into summer hotels, and with the Inside Inn and the thousands of private rooms that will be for rent during the fair, there need be no fear of any one failing to secure comfortable quarters at reasonable rates.

The committee on finances is also receiving most encouraging support with its subscription lists, and, taking it altogether, with commodious central places of meeting all secured, a list of 5,000 rooms at the disposal of intending visitors, and a large attendance on the part of the profession of the United

States to make this an opportunity for a gala trip of exploration and sightseeing, the success of the Portland session of the American Medical Association is assured.

Rates to Portland.

We are daily receiving requests for information regarding the rates to Portland for the next session of the American Medical Association. There is nothing further to announce than what has already been announced, namely, that the rates thus far made are $45 for the round trip from Missouri River points, St. Paul, Omaha, St. Joseph and Kansas City. The rate from Chicago is $56.50, this rate being $5 less than the regular one-fare rate now prevailing. While no official action has been taken by many of the passenger associations, undoubtedly one-half rates will prevail from all points east of those mentioned. One will have the option of returning by a different route, no matter by what road one may go. For instance, one may go by any of the extreme southern routes and may return by the Canadian Pacific or by any of the routes between these two extremes. The return route must be designated on ticket, hence it must be decided on before starting. Stop-over privileges will be given at important points, the time limit being 90 days. It is to be understood, however, that a passenger is always sent to his destination by the shortest route. If he wishes to go through a point not on this direct route an extra charge is usually made. For example, if one wishes to return by the Southern Pacific from Portland to St. Louis, one can not expect to be routed through San Francisco and Los Angeles, unless it is so specified, because the railroad can send its passengers by the direct line through Oregon, Idaho, Wyoming and Nebraska. Thus on some lines, one who visits San Francisco or other coast points and starts back from there will probably have to pay something between $7 and $11, no special rate having thus far been made, although an extremely low one may be expected. We speak particularly of this point, so that purchasers of tickets will decide on routes carefully and will secure a full understanding from the ticket agents of whom they purchase. The exact route should be specified on the tickets as stated above. These rates can be obtained by anyone, so that physicians can be accompanied by friends. Further information can be obtained by applying to the agents of the railroads all over the country, although official announcements in regard to many of the points mentioned above have not been issued.

The Yellowstone Park-Portland Special.

As announced in a previous issue, arrangements have been made for running a special train from Chicago by way of Yellowstone Park. This train will run over the Chicago, Burlington and Quincy Railroad to Minneapolis, and thence over the Northern Pacific. As first announced, the number will be limited to 250. It has been decided, however, that this number is too large for one party in the park, consequently the train will be divided into two sections, each limited to 125. The first section will leave Chicago, June 30, arriving at the Yellowstone Park July 2. This train will reach Portland on the morning of July 10. The second section will leave Chicago July 1, reach the park July 3, and Portland on the afternoon of July 10. The extra expense connected with the Yellowstone Park trip will be $49.50. This will include all expenses from the time of leaving Livingston, at which point a branch leaves the main road for the park, until the return to Livingston, including hotel expenses, stage transportation, etc. A dining car will be attached to each of these trains during the entire trip. There will also be an observation car on each of the sections. A much larger number have registered for this special than was expected, and we would suggest that those who are thinking of taking advantage of this occasion to visit the park should send in their names at once. We repeat, the number will be limited absolutely to 250, 125 to leave on the first section and 125 on the second. Those going by this train will have the privilege of returning by another route.

The Public Service.

Army Changes.

Memorandum of changes of station and duties of medical officers, U. S. Army, week ending Feb. 18, 1905:

Kendall, Wm. P., granted twenty-two days' leave, to take effect Feb. 5, 1905; on expiration to proceed to Manila, P. I.

Torney, Geo. H., deputy surgeon general, left U. S. Army General Hospital, Presidio of San Francisco, on thirty days' leave of absence.

Stephenson, Wm., surgeon, assumed temporary charge of chief surgeon's office, San Francisco.

Owen, Wm. O., surgeon, left Fort Logan, Colo., en route to Washington, D. C., on delay in reporting for treatment at U. S. Army General Hospital, Presidio of San Francisco.

Wells, Geo. M., surgeon, relieved from duty in Philippine Division and ordered to proceed to San Francisco and report for orders.

George, William R. S., contract surgeon, returned February 4 to his proper station, San Juan, P. R., from detached service at Cayey, P. R.

Navy Changes.

Changes in the medical corps, U. S. Navy, for the week ending Feb. 18, 1905:

Williams, R. B., P. A. surgeon, detached from the Naval Hospital, Norfolk, Va., February 14 and ordered to the *West Virginia*.

Dunn, H. A., asst.-surgeon, detached from the Naval Hospital, New York, February 20, and granted leave for six weeks.

Bagg, C. P., surgeon, detached from the Naval Hospital, Mare Island, Cal., February 21, and ordered to the Naval Station, Guam, L. I., sailing from San Francisco February 25.

Backus, J. W., asst.-surgeon, ordered to the Naval Hospital, Portsmouth, N. H., and to additional duty on the *Southery*.

Bogan, F. M., P. A. surgeon, detached from the *Decatur* and ordered to the Naval Hospital, Yokohama, Japan, for treatment.

Munson, F. M., asst.-surgeon, detached from the Naval Station, Olongapo, P. I., and ordered to the Naval Station, Guam, L. I.

Public Health and Marine-Hospital Service.

List of changes of station and duties of commissioned and non-commissioned officers of the Public Health and Marine-Hospital Service, for the seven days ending Feb. 15, 1905:

Gassaway, J. M., surgeon, Bureau letter of Feb. 3, 1905, granting leave of absence for ten days from February 9, amended to read ten days from February 14.

Wertenbaker, C. P., surgeon, relieved from duty at the Immigration Depot, New York, and directed to proceed to Havana, Cuba, for duty in the office of the United States Consul General. Granted leave of absence for twenty days from January 22.

Wickes, H. W., P. A. surgeon, leave of absence for one day granted by Bureau telegram of January 28 revoked.

Fricks, L. D., P. A. surgeon, to report to Surgeon G. W. Stoner, Immigration Depot, New York, for duty.

Earle, B. H., asst.-surgeon, granted leave of absence for seven days.

Fowler, J. B., A. A. surgeon, granted leave of absence for thirty days from March 7.

Richardson, S. W., pharmacist, relieved from duty at Boston, and directed to proceed to Wilmington, N. C., and report to the medical officer in command for duty and assignment to quarters, relieving Pharmacist Malcolm McKay.

McKay, Malcolm, pharmacist, on being relieved at Wilmington, N. C., by Pharmacist S. W. Richardson, to proceed to Boston, and report to the medical officer in command for duty and assignment to quarters.

BOARD CONVENED.

Board convened to meet at Fortress Monroe, Va., for the purpose of making an investigation as to the cause of the damage to the launch *Spray*. Detail for the board: Surgeon J. B. Stoner, chairman; A. A. Surgeon H. W. Keatley, recorder.

Health Reports.

The following cases of smallpox, yellow fever, cholera and plague, have been reported to the Surgeon General, Public Health and Marine-Hospital Service, during the period from Feb. 11 to Feb. 17, 1905:

SMALLPOX—UNITED STATES.

California: San Francisco, Jan. 21-28, 1 case.

Illinois: Feb. 4-11, Chicago, 26 cases, 2 deaths; Galesburg, 1 case.

Kentucky: Louisville, Feb. 2-9, 2 cases.

Louisiana: New Orleans, Feb. 4-11, 8 cases, 4 imported.

Michigan: Detroit, Feb. 4-11, 1 case.

Missouri: St. Louis, Feb. 4-11, 41 cases, 2 deaths.

New York: New York City, Feb. 4-11, 3 cases, 1 death.

Ohio: Dayton, Feb. 4-11, 1 case.

Pennsylvania: Altoona, Feb. 4-11, 1 case imported from Portage; Lancaster, Jan. 28-Feb. 4, 1 case.

Tennessee: Feb. 4-11, Memphis, 3 cases; Nashville, 2 cases.

SMALLPOX—FOREIGN.

Argentina: Buenos Aires, Nov. 1-30, 18 deaths.

China: Shanghai, Dec. 24-Jan. 7, 15 cases, 18 foreigners, 130 deaths, natives.

Ecuador: Guayaquil, Jan. 18-25, 1 death.

France: Paris, Jan. 21-28, 17 cases, 4 deaths.

Germany: Bremen, Jan. 14-21, 4 cases.

Great Britain: Jan. 21-28, Hull, 7 cases; South Shields, 2 cases; Leeds, Jan. 28-Feb. 4, 20 cases, 1 death; Newcastle-on-Tyne, Jan. 1-28, 7 cases, 1 death.

India: Bombay, Jan. 10-17, 62 deaths; Calcutta, Jan. 7-14, 2 deaths; Karachi, Jan. 8-15, 1 case; Madras, Dec. 31-Jan. 13, 4 deaths.

Italy: Lecce Province, Jan. 12-26, 95 cases; Palermo, Jan. 21-28, 31 cases, 5 deaths.
Norway: Christiania, Jan. 21-28, 2 cases.
Russia: Warsaw, Dec. 3-10, 4 deaths.
Turkey: Constantinople, Jan. 22-29, 9 deaths.

YELLOW FEVER.

Ecuador: Guayaquil, Jan. 18-25, 3 deaths.
Mexico: Coatzacoalcos, Jan. 28-Feb. 4, 1 death; Juchitan, Jan. 29-Feb. 4, 2 cases.
Panama: Colon, Jan. 23-29, 1 case, 1 death; Panama, Jan. 1-28, 13 cases, 4 deaths.

CHOLERA.

India: Calcutta, Jan. 7-14, 106 cases.
Russia: Don Territory, Dec. 31, 2 deaths; Government of Astrachan, Nov. 14-21, 3 cases, Dec. 21-27, 1 case; Government of Baku, Nov. 14-21, 168 cases, 5 deaths, Dec. 14-21, 273 deaths; Government of Erivan, Nov. 14-21, 324 cases, 279 deaths; Government of Samara, Dec. 21-27, 1 case; Government of Saratow, Nov. 14-21, 11 cases, Dec. 21-27, 8 cases, 3 deaths; Trans-Caspian Territory, Nov. 14-21, 37 cases, Dec. 21-24, 3 cases; Volga Province, Nov. 14-21, 69 cases.
Turkey in Asia: Van, Dec. 31, 27 cases, 12 deaths.

PLAGUE—FOREIGN.

Brazil: Para, Jan. 1-9, 1 death.
Egypt: Jan. 7-14, Suez, 5 cases, 4 deaths; Tukh District, 4 cases, 3 deaths.
India: Bombay, Jan. 10-17, 208 deaths; Calcutta, Jan. 7-14, 33 deaths; Karachi, Jan. 8-15, 61 cases, 54 deaths.
Mauritius, Nov. 4-Dec. 1, 97 cases, 60 deaths.
Russia: Ural Territory, Dec. 26-28, 34 cases, 35 deaths.
Straits Settlements: Singapore, Dec. 24-31, 5 deaths.

Medical Organization.

THE NEED FOR MEDICAL ORGANIZATION IN GEORGIA.

By J. N. McCormack, M.D.

CHAIRMAN OF THE COMMITTEE ON MEDICAL ORGANIZATION.

BOWLING GREEN, KY.

After a pleasant vacation in Cuba and Florida, during which just enough work was done to relieve the monotony, I began to meet the appointments previously made for me by the Georgia State Medical Society. Beginning at Savannah, in the southeastern part of the state, I crossed from city to city to the southwestern side, then up to Columbus and across by Atlanta, Athens and Madison, closing at Augusta February 2, and then taking up a similar itinerary in South Carolina.

Aside from the unusual and extreme weather, and long and often unseasonable hours of travel necessary to keep the engagements, the personal experience was most agreeable. Cordial, old-fashioned hospitality greeted me everywhere, and in the families of physicians I met some of the finest and most interesting women to be seen in any country.

The condition of the profession of Georgia constantly impressed me as most unique. In one of the great states of the union, well denominated "the Empire State of the South," with its leaders ranking with the best class in this country, there never has been any real, practical attempt at organization. As a result, although in proportion to population there seemed to be less overcrowding of the profession than usual, poverty among its members, with all of the attendant evils to them, and still greater danger to the public, seemed, after careful inquiry, to be more general and pronounced than in any other state I have visited. For instance, although there were notable individual exceptions, a smaller percentage of the physicians than usual owned their own homes, or had ever taken postgraduate instruction, always in my experience fair tests of professional conditions. Several gentlemen courteously called on me to explain that they were too busy to attend the meetings or to give the time necessary for membership in county societies, and yet in nearly every case of this kind it developed on inquiry that these worthy, well-meaning, middle-aged men, most of whom frankly said they had never attended a medical meeting of any kind since their graduation, not only lived in rented houses, but, what was still more important to them and to their patrons, had never been able to avail themselves of the cheap, and to those not in touch with an active local society the almost essential postgraduate instruction to be had in every medical center. As a lifetime student of medical sociology these observations were most instructive, each conveying its own lesson and suggesting its own remedy.

The lack of organization was forcibly illustrated in another and a larger way. The executive boards, the State Board of Health and the State Board of Medical Examiners, the legal arms through which a properly organized profession must make itself effective in all public matters, although made up of good men, are not only subject to political appointment and tenure, but have no connection or means of co-operation with each other or with the Georgia State Medical Society, a co-operation now recognized as essential between all of the bodies managing professional interests in any state. This means, of course, that such boards are practically deprived of the moral support of their medical constituency in their everyday work, that quackery in all its most flagrant forms is rampant, with the press and public sentiment on its side, while a profession capable of great strength, if organized and united, is helpless to secure or to enforce remedial legislation.

The State Medical Society, on the other hand—and this will be a surprise to those of the old régime who have given undue importance to large central societies, state, interstate or national, as factors in organization work—is in a flourishing condition, largely owing to the efforts of its most efficient secretary. It has a membership of 700 out of a total eligible medical population of 3,000; it always has a fair attendance and an interesting program, and is in every way fully up to the average of bodies of this kind under the old order of things. That such a large, worthy and long-established organization has exerted so little influence on either the profession or the public will be readily understood when it is known that it has no real foundation, having no local societies in affiliation with it, and that no systematic attempt has ever been made to foster these or to reach and benefit the rank and file of the profession, that large and important element everywhere which can not hope to attend state meetings regularly, but which is none the less entitled to representation and a voice. Beside, they have practically but a two days' session, meeting usually about noon the first day and adjourning at the same hour on the third, and the short business sessions are really mass meetings of those present, who do not claim to represent any one but themselves, almost of necessity limited to the transaction of routine business, with neither the time nor the opportunity for considering the real needs of the profession and the state in a broad way which their importance demand.

All of this seems the more remarkable in a state divided only by an arbitrary line from Alabama, where for more than a generation every county, some of them containing but three or four physicians, has had an effective county society in full legal control of its medical and health affairs, with over 92 per cent. of the entire profession enrolled as permanent members of both these and the state association, and with its organized profession made by law as much a part of the warp and woof of the county and state governments as the legislative, judicial or executive departments. As has been more recently demonstrated in many other states, the organization has been so effective in Alabama not so much on account of its strong state association, as because it is rooted and grounded in the body of the profession in every section, and that it exists and unselfishly exercises the great powers which years of harmony and co-operation have given it, for the benefit not only of its own members, but of the public also, whose interests are inseparable from ours.

As the question of reorganization is now pending before the Georgia State Society, I did not deem it proper for me to discuss this phase of the subject in any of my talks, confining myself to an exposition of the methods, purposes and possibilities of local or county societies as the only feasible foundation for such a far-reaching, comprehensive organization of the profession of this country as is demanded to minimize the evils which have so long dominated it, and give it that voice and influence in the control of all affairs within its realm of which it has heretofore been deprived by dissensions within its own ranks. I explained and urged that these dissensions had never existed except between local men, those who think they have competing interests, and that they can only be minimized and finally cured, as has now been abundantly demonstrated, by such systematic, all-pervading local organizations, as will

bring these worthy men together in frequent and unrestricted consultation over the condition and needs of the profession and people of their jurisdiction. I insisted that the American Medical Association, aside from the scientific work done in the sections during four days of the year, was only an essential factor in this work as a bond of union between the states, for concentrating and making effective the instructions coming to it through the delegates from the states, and for the maintenance and distribution of its great journal; that the state societies, in session but two or three days, in addition to the scientific work done, were important only as a bond of union between the counties, as a help in promoting organization in these, and for voicing and putting into operation the instructions of delegates from its constituent bodies; but that the county societies, which must be the foundation and groundwork of any real organization, could meet monthly, or even weekly, as many of them are doing, not only for scientific and modern postgraduate work, but for the cultivation of such personal relations as will make the profession a credit to itself and to the community, and ultimately will unite it in the study and promotion of every interest in which it is concerned. I advised them frankly that this would be difficult work at the outset, that no plan which could be proposed for such local societies would be found either perfect or self-operating, that local medical organization is a tree rather than a vine, and that the Alabama plan, simplified and made more democratic by the Association, was intended only as a trellis or framework for the assistance and support of such organizations during the evolutionary period of their growth.

While I did not feel at liberty to talk on the subject of state reorganization in my addresses, in the discussion which nearly always followed, and in private conversation, no such restriction could be imposed, and others expressed themselves freely, as they had a right to do. Inquiries were made as to every detail of the methods suggested for local improvement, and the interest and enthusiasm were almost universal. In fact, the only discordant note I heard was from a little journal whose editor was expelled from the state society at its last meeting, after I had, without his knowledge, urged a milder sentence, and who naturally feels resentful toward everything in the way of medical organization. When it is known that the proposed constitution expressly provides that only white physicians are eligible for membership, and that affiliation with the American Medical Association is entirely voluntary, and can be severed by Georgia or by any other state the first day it becomes undesirable for any reason, and that the Association can have no possible interest in the profession of any state except for the mutual help to come from such relations, his criticisms, in so far as they had any weight, only served to strengthen the position of those who want to put Georgia in the ranks of organized medicine.

Under a proper system of organization the possibilities before this profession are almost beyond the conception of its members, so long has the state been under the almost complete domination of the quack interests. Not an obstacle suggested, in the way of small and sparsely settled counties, difficulties in travel and other like things, but have been met and overcome in Texas, Arkansas, Michigan, Kentucky and other states, which have already tried this plan with such good results. Experience has demonstrated, over and over again, that even the fear that a single member of the present state socity might be lost is groundless. As there are now practically no county societies, such members would return home and become the natural centers around which these would be formed, and the state society could easily have 2,000 members by the next annual meeting. In one year Texas increased the membership from 309 to 2,510, Michigan from 452 to 2,100, and so on through the list of states. A percentage equal to Alabama would give Georgia 2,760 members, but this could only be hoped for after several years of painstaking work. With such prospects possible under the plan proposed it is submitted to this great profession that no one should raise his voice in opposition unless he has something better to offer.

Society Proceedings.

ACADEMY OF MEDICINE OF CLEVELAND.

Twenty-fourth Regular Meeting, held Jan. 20, 1905.

The President, Dr. C. J. Aldrich, in the Chair.

Cesarean Section in a Case of Torsion Due to Ventrofixation.

DRS. H. H. POWELL and F. E. BUNTS reported the case of a woman, aged 27, who had had a ventrofixation of the uterus performed six years previously. When first seen the patient was about five months pregnant and showed great debility and depression. The pelvic measurements were normal. The abdominal scar was about eight inches long, deeply depressed and adherent to the uterus. Under appropriate treatment her condition improved, although she had almost continuous pain and occasional flowing. Finally, at about full term, the pains became so severe that an attempt was made to bring on labor. As expulsive efforts could not be induced in the uterus, cesarean section was performed. The abdominal wall was much attenuated. Extending from it to a point on the uterus six inches below the fundus was a short, strong ligament about one and one-half inches wide. This ligament was severed and the uterus incised on its anteriorly presenting surface from a point just below the fundus downward to below the attachment of this band. The child and placenta were readily delivered and the incision closed by tier sutures of silk, plain and chromicized catgut. When uterine contractions began the uterus was seen to rotate on its cervical axis so that the incised uterine wall which was thought to be the anterior one, proved to be in reality the posterior. The rotation was probably due to the low point of fixation on the posterior uterine wall. When the enlargement of the uterus began the fundus escaped laterally from beneath the band, thus rotating the uterine body on its perpendicular axis. The silkworm gut used for the fixation was found in the band of adhesions.

DISCUSSION.

DR. HUNTER ROBB said that care was necessary in stitching the uterus forward. The operation is indicated when other means of retaining the uterus in position prove insufficient. The suspension is radically different from a fixation; in the former a strong band is rarely formed except after infection. Most complications requiring section follow fixation.

DR. POWELL said he had recently seen two cases of suspension that proved to be fixations, and each caused serious complications during labor. High forceps or turning are required in many of these cases.

DR. W. H. HUMISTON, who saw this case at operation, said he was astonished by the size of the band of adhesion. It was as thick as the tendo Achilles and twice as wide. For the past three years he has never performed a suspension or fixation if any ovarian tissue has been left. In such cases he has shortened the round ligaments by the Gilliam operation, and the results have been very good.

DR. C. D. WILLIAMS drew attention to the difference between fixation and suspension; the former produces a pathologic position while the latter allows a normal mobility of the uterus. Fixation is only allowable in prolapse or after removal of the tubes or ovaries. Fixation resulting from a suspension operation is usually due to infection of the abdominal wall. It can usually be avoided by making the abdominal incision rather high up and stitching the uterus to the abdominal wall well below the lower angle of the incision.

DR. A. F. HOUSE thought that the operation of suspension itself was not dangerous, but that a faulty method of performing it may cause trouble. It is, of course, impossible in some cases to be sure that a fixation will not result.

Diagnosis and Treatment of Intestinal Perforations in Typhoid.

DR. RICHARD H. HARTE of Philadelphia read a paper which was a thorough review of this subject.

DISCUSSION.

DR. LOWMAN thought that speed in operating is most essential. The diagnosis of a perforation is a very essential point.

All the classical symptoms may be absent and no single symptom is invariably found. A valuable sign is the absence of the usual undulatory abdominal movement; the whole abdomen moves at once and even this motion is lost later. Exploratory laparotomy is justifiable when the diagnosis is in doubt; a small incision may be sufficient. If no perforation be found and a culture prove sterile the gut is usually intact.

DR. C. E. BRIGGS said it was necessary to distinguish between the signs and symptoms of perforation as the latter are useless in lethargic patients. The altered pulse rate, abdominal rigidity and altered type of respiration are the most important signs. He thinks enterostomy preferable to suture in some cases. It is very simple, relieves flatus, and the septic absorption is less than if the lumen be constricted by an extensive infolding of the edges.

DR. N. ROSEWATER thought that ergot with strychnia was useful in some cases. He had seen its good effects in a case which he had recently had. There were symptoms of perforation which cleared up. Twelve days later the patient died, nine perforations being found, two walled off, showing the possibility of recovery in perforation.

DR. G. W. CRILE said there was a marked antithesis between the toxic action of typhoid and pyogenic infections. With a stimulation or an inhibition of the vasomotor center there results a fall or a rise of blood pressure. In typhoid the vasomotor center is depressed, the venous circulation is congested and the blood pressure is low; the skin is of a dusky color. There is a great contrast in pyogenic infections; the vasomotor center is stimulated, the blood pressure is high, the peripheral venous circulation is contracted and there is marked pallor. It is difficult to estimate the changes that perforations should cause in the blood pressure. In perforation there is a determination of blood to the splanchnic area with marked pallor and a peculiar facies.

DR. HUNTER ROBB inquired as to the occurrence of acute appendicitis with typhoid and whether a typhoid perforation had been reported in the appendix.

DR. HARTE said that the altered type of abdominal respiration must be an important symptom. Speed is valuable in all operations, and he regretted that surgeons do not insist on this point. Time can be saved if the surgeon and his assistant simultaneously examine opposite sides of the gut. On finding the perforation, the assistant can proceed with the irrigation while the surgeon closes the opening. He has performed the operation in twelve minutes, and fifteen should usually suffice. He uses a large amount of gauze drainage so that at times it is unnecessary to suture the abdominal wound. The changes in blood pressure are probably of value, but he has had no personal experience with them. He has seen several cases of perforating appendicitis and ordinary appendicitis during typhoid. He insisted on the advisability of the surgeon being familiar with the general condition and aspect of the seriously ill typhoid patients in the hospital, and the value of obtaining the patient's consent to operation in advance whenever typhoid perforation is feared.

CHICAGO MEDICAL SOCIETY.

Regular Meeting, held Feb. 8, 1905.

Dr. William T. Belfield in the Chair.

Present Limitations in Serumtherapy.

DR. H. T. RICKETTS said that inquiry into the value of diphtheria and tetanus antitoxins reveals the fact that the latter falls far below the former as to its therapeutic value. The antitoxin treatment of tetanus may be considered hopeless at present. The chief value of tetanus antitoxin is its prophylactic use, as it has been clearly demonstrated that if the antitoxin is given to a patient in whom there is any suspicion or likelihood of the development of tetanus, the disease does not develop. A striking example of this is seen in Fourth of July wounds. In some of the eastern hospitals, patients who received wounds on the Fourth of July and who were injected with tetanus antitoxin as a prophylactic, did not develop the disease. In a hospital in Prague a threatened epidemic of tetanus was controlled by giving prophylactic injections of tetanus antitoxin to all inmates in the institution. The therapeutic value of diphtheria antitoxin is so well established that little or nothing need be said regarding it. In regard to bactericidal serums, practically no results of value have been obtained in the treatment of established infections, as, for instance, antityphoid serum, anticholera serum or antiplague serum. Published statistics do not warrant the conclusion that so-called bactericidal serums are of any value in treating diseases. Antistreptococcic and pneumococcic sera are of very little value.

Plague and Late Cholera Epidemic in the Philippine Islands.

DR. PAUL C. FREER, superintendent of laboratories of the Philippine Islands, said that the Philippine Islands were visited by two cholera epidemics before American occupation, one in 1882 and the other in 1888, and in these years the mortality was very high. In Manila alone the records showed that there were as many as a thousand cases at one time. Both of these epidemics were serious, and, so far as could be discovered, very little was done to check them. During both of these epidemics Manila had no water supply except from wells, and it was after the second epidemic of 1888 that one of the former governor-generals gave a donation to start the Manila water supply works, which was completed afterward. The third cholera epidemic occurred during the American occupation and about three years after Americans landed on the islands. Dr. Freer referred to the organizations in the Philippine Islands and the scant means at hand for limiting the epidemic. In order to secure complete co-operation the Philippine Commission established the Board of Health. This was composed of a commissioner of public health, a secretary who was a Filipino, a chief health inspector, a sanitary engineer who took charge of the engineering department, and a superintendent of laboratories. When the Board of Health was organized, in 1901, it was without ambulances; it had no contagious disease hospital; it had no disinfecting apparatus and wagons, and means of transportation were very poor. The city of Manila was divided into seven districts, each in charge of a medical officer taken from the contract medical service. These officers, together with a corps of medical inspectors, began a system of house-to-house inspection. At this time the most serious disease was bubonic plague. Although the number had diminished markedly since American occupation, a recrudescence of the epidemic was feared. Many of the facilities acquired for controlling the plague epidemic were put to good use subsequently in dealing with cholera. A large barracks was constructed which would hold 2,500 people. When plague occurred in a house the patients were taken from it to the hospital, thus leaving the premises free for disinfection, etc. About December, 1901, three months after the plan was first discussed, there were constructed six barracks which accommodated a thousand people comfortably, and during the cholera epidemic they took in as many as 2,400 at one time. The Board of Health procured eight or nine ambulances and equipped itself as well as it could with disinfecting apparatus, etc. Whenever plague was suspected in a certain house a member of the laboratory staff was called in for diagnosis, and if the case proved to be plague the patient was taken to the hospital, or, if dead, to the morgue, and a radical alteration of the house undertaken; either its destruction by fire, if beyond repair, or complete rebuilding. It became necessary to destroy and rebuild whole districts in the city, and in this way plague was eradicated completely from the districts where it was prevalent. The main weapon against plague was the destruction of rats. In the first month the Board of Health destroyed about 2,000 rats, after which the number ran up to 20,000 a month. Fifty thousand rats were caught in the first three months. A large number of rats were examined at the laboratory for the plague bacillus. Two hundred and seventy-two rats were found to be infected with plague and had come from various houses. One-half of these houses were disinfected, burned down, if necessary, or altered. They managed to

diminish the number of cases of plague by these measures so that in March, 1902, there was not a case of plague in the city, nor had there been one for three weeks.

Cholera patients were isolated in a contagious disease hospital. The houses in which cholera was most prevalent were burned first and the property appraised afterward. Two thousand people were taken out of the infected district and transported in wagons, ambulances, etc. The number of cases soon diminished until finally the disease was entirely controlled and eventually wiped out.

A serum laboratory has been established which produces all of the antitoxins and sera necessary for work in the tropics, including rinderpest serum. The Board of Health has procured new ambulances, has enlarged its disinfecting corps and has perfected district organization.

Chlorid Retention in Nephritis.

DR. JOSEPH L. MILLER said that a review of the literature since Widal and Javal's original communication shows quite uniform confirmation of their views, that patients with acute and chronic parenchymatous nephritis have marked inability to eliminate chlorids. As a result of the retention, the patient increases in weight, due to edema. The albumin in the urine, following the ingestion of 10 grams of sodium chlorid daily, is increased and the patient may develop symptoms resembling uremia. In animals with artificial nephritis the use of salt increases the albumin. The organs of patients with nephritis show an excess of sodium chlorid. Kovesi has shown that nephritics, after the ingestion of large amounts of NaCl, do not perspire, due to increased osmotic pressure of the blood, and the edema is the result of this retained fluid. As it has been shown that ingestion of large amounts of salt may increase the edema due to portal obstruction, cardiac insufficiency and even the inflammatory edema, many believe the chlorid retention may be of extrarenal origin. Miller studied two cases of acute and seven of chronic parenchymatous nephritis. The chlorids were estimated by the Salkowski-Volhard method for nine consecutive days. For three days in the middle of this period the patients received, in addition to their food, ten grams of sodium chlorid daily. All showed a retention of ten to twenty-five grams during the three days. The edema became more marked, the patients gained in weight, and the amount of albumin increased. Two patients showed uremic symptoms following the extra sodium chlorid. Four normal individuals were examined in the same manner, and all showed a chlorid retention equal to the nephritis. They also gained in weight. From this it is concluded that these patients developed an undetectable edema, while in the nephritics with the tissues already waterlogged a moderate increase in edema could be detected. These patients did not show any albuminuria or uremic symptoms. As a final conclusion on this matter there is no doubt that sodium chlorid should be restricted in nephritis. The broths and soups contain very large amounts of salt. Subcutaneous injections of salt solution must be used with caution, if at all.

ASSOCIATION OF CLINICAL ASSISTANTS OF WILLS HOSPITAL.

Regular Meeting, held Jan. 18, 1905.

Dr. J. Hiland Dewey in the Chair.

Gumma of Iris and Ciliary Body.

DR. STANLEY S. SMITH reported a case which presented all the characteristic symptoms of the condition, and which was fast becoming well. Dr. Smith stated that it was very instructive to note the secondary. rapid diminution of vision produced by haze in the media which probably had been caused by a deposition of the gummy infiltrates into the chambers of the eye.

DR. JOHN T. KRALL commented on the comparative painlessness of specific cyclitis and the character of the infiltration into the aqueous and the vitreous which was chiefly composed of round-cell exudates. In support of the belief of others that gummata of the ciliary body usually occur on the upper border of the cornea, he had seen but one in which the swelling was situated on the lower side.

The various methods of administering mercury were informally discussed, the consensus of opinion being in favor of the use of mercurial ointment by inunctions.

Interstitial Keratitis.

DR. JOSEPHINE W. HILDRUP reported ten cases of interstitial keratitis. The ages of the patients varied from 6 to 58 years. The dyscrasia had been very carefully studied in all. Females had been preponderant in the series. With but one or two exceptions all of the cases had passed on to resolution.

DISCUSSION.

DR. JAMES A. KEARNEY stated that he had seen much good accrue from the use of inunctions of protoiodid of mercury.

DR. DEWEY had not had much experience with subconjunctival injections and had seen some unfortunate results, such as conjunctival ulceration, giving rise to disfigurement from their use.

DR. KEARNEY exhibited a case in which the right eye was being treated by the ordinary routine methods, supplementing these by subconjunctival injections of common salt solution in the left eye, the latter organ (although the first involved) seeming to improve much more rapidly than its fellow.

DR. KRALL stated that he had learned to share the opinion of others that if injections were made under the conjunctiva their effects would be to produce a number of adhesions between the bulbar conjunctiva and Tenon's capsule, and stated that even though the injections were made into the capsule their good results were but transitory, as adhesions were sure to occur. He believed that such injections did more harm than good.

Double Pterygium.

DR. KEARNEY presented a case of double pterygium in which one eye had been operated on by the von Arlt method and the other by the McReynolds.

DISCUSSION.

DR. KRALL was of the opinion that the McReynolds operation had no advantage over the von Arlt. He believed that every case should be treated on its own merits, one method of operation not being applicable to all.

Travel Notes.

AN INTERSEMESTRAL EXCURSION.

LEWELLYS F. BARKER, M.D.

CHICAGO.

(Continued from page 573.)

MEDICAL CLINICS.

The three great clinics of internal medicine in Vienna are led by Professor Hermann Nothnagel, Leopold Schröter and Eduard Neusser, respectively, and with these chief professors are associated a veritable host of younger assistant professors and privat docents, among whom may be mentioned Leopold Oser, Emil Ritt, v. Stoffela, Franz Chovstek, W. Winternitz, M. Heitler, N. Ortner, J. Pal, J. Mannaberg, H. Schlesinger, J. Drozda, A. Biach, A. Pick, F. Kovács, A. Hammerschlag, M. Sternberg, E. Schütz, M. Herz, A. Klein, F. Obermayer, R. Kolisch, J. Weiss, E. Schwarz, A. Strasser, A. v. Weismayr, W. Pauli, G. Singer, L. Braun, A. Katz, S. Erben, F. Pinelles, A. Schiff, W. Türk, E. v. Czylharz, R. Schmidt, F. Wechsberg, J. Donath and M. Weinberger.

Nothnagel has the first medical clinic, Neusser the second, and Schrötter the third. All three are at the Allgemeine Krankenhaus, Nothnagel's clinic being in the eighth hof, Neusser's in his special auditorium, and Schrötter's in the second hof. Each chief holds a clinic of two hours on five mornings of the week, nominally from 7 to 9 a. m., in which the courses on general clinical medicine are given. Assistants in each of the three clinics give courses on physical diagnosis (ausculta-

tion and percussion), and in addition courses in great number and variety on a multitude of special subjects in internal medicine are offered by assistants and docents. It has long added to Vienna's attractiveness, especially to American students, that one can at any time get a definite, cut-and-dried six weeks' course on almost any subject in the field of clinical medicine and surgery. Berlin has not gone so far in the provision of such courses, and I have heard many a student fresh from "finished" courses in Vienna complain on arriving in Berlin that he could find "nothing to do." There are advantages and disadvantages in the provision of courses of this kind; the advantages are obvious to all; to those to whom the disadvantages are not obvious, there would perhaps be but little use in explaining what they are. But I have always felt sorry for the student who on reaching Berlin could find "nothing to do."

One of the docents in internal medicine, especially, is held in very high esteem by American students who have worked with him. I mean Dr. Franz Kovács. Though in the university, he has never been advanced in rank beyond his docentship, he has a high hospital position, being Primärarzt to the fourth medical section of the Allgemeine Krankenhaus. Having heard so much of him as a teacher, I was especially interested in meeting him and in following him through his wards. He has an abundant material and studies it carefully. A quiet, earnest, and very serious man, he sets an excellent example of steady, systematic, conscientious clinical work. I was much impressed by the thoroughness of his routine, his careful analysis of the anamnesis, his very complete objective examination, his brief but sufficient description of the *status praesens*, the comprehensiveness of his diagnoses, his guarded prognoses and his efforts at rational therapy. His course entitled "Diagnostik innerer Krankheiten," which he repeats every four or six weeks, is always full to overflowing with men who need a fundamental training in the methods of clinical examination. He teaches his men to be orderly and systematic; he knows how to teach auscultation and percussion; how to make students properly palpate a spleen, etc.; and he also knows how, having made the objective examination, to teach them to differentiate between diseases which have physical signs more or less in common; in other words, his course includes just the sort of work that every medical student should do in the third and fourth years in the medical school; unfortunately, as yet the work is done as thoroughly as he does it in only a very few of our American medical schools. This course, then, is one which can be warmly recommended to many American physicians who go to Vienna for medical work, to anyone, in fact, who has not already had a thorough drill in the elementary facts and methods of internal medicine. For it is only after having had such a course somewhere that the physician is prepared to undertake higher work in internal medicine in clinics where studies of a more original character are carried on.

LABORATORY WORK.

The courses dealing with the clinical study of the blood and the chemical study of the stomach juice and feces are always popular in Vienna; those given by W. Türk and R. Schmidt, both docents in Neusser's clinic, I heard highly spoken of.

Of the assistants in internal medicine engaged in actual original research in Vienna, the privat docent Wolfgang Pauli is one of the most important. Thanks to a thorough training in physics under Mach, in chemistry under Hofmeister, and in physiology under Hering, he has brought to medicine a mind unusually well suited for attacking medical problems of a physical or physico-chemical nature. His studies of the phenomena of imbibition and of the alteration of the physical condition of colloid substances under the action of various reagents, and recently his pharmacodynamic investigations have compelled attention in a wide circle of those who interest themselves in the progress of higher experimental medicine. While the first two series of researches are at present of most interest to physiologists and physiologic chemists, the third series, dealing with pharmacodynamics, promises to be of fundamental importance for the practical medical man.[4] Pauli's studies, like those of Meyer and Overton on the theory of narcosis and Straub's work on the validity of the law of mass action for the distribution of certain poisons in the organism, go far toward showing that the methods of physical chemistry are to throw new light on, and to give to the physician a deeper understanding than can be obtained in any other way, of the action of drugs in the body. Dr. Pauli's work, like that of Professor Jacques Loeb, has to do largely with the action of ions, those electrically charged particles into which the various salts (electrolytes) dissociate when they are dissolved in water. As is well known, the mineral substances dissolved in the animal juices in the concentration in which they exist there are in largest part dissociated into their constituent ions. Professor G. N. Stewart's work on the electrical conductivity of the blood serum will be recalled in this connection. It is just as true that, if salts of the metals or alkalies be prescribed for patients, they act in the body through the ions into which they dissociate on solution in water. Even certain substances of pharmacologic importance which scarcely become ionized at all in aqueous solution, for example, the esters, may, inside the organism, be converted into ionizable substances.

Of all the constituents of the protoplasm of the cells, the proteid substances appear to stand in the most striking relation to the salts. Thus the solution of proteids, their precipitation, their coagulation by heat—are all remarkably influenced by the presence of salts, and Pauli has through a long series of experiments endeavored to determine more exactly the exact relations which exist.

It is known that the neutral salts of the alkali metals, of ammonium and magnesium, for example, stand in a very simple relation to the problems here under consideration; though these salts throw down precipitates of albumin, by dialysis of the salts the albumin can be reobtained almost entirely unaltered. The most important laws (according to Pauli) for these reversibilities of condition are as follows: If the salts be arranged according to their relative precipitating power, for every metal-ion (kation) the same series of acid-ions (anions) holds good, and, *vice versa*, for every acid-ion (anion) the same arrangement of kations. The precipitating effect of salt is therefore the resultant of the precipitating effects of its constituent ions and these ion-properties are in high degree independent of one another.

A second law refers to the nature of the influence of the ions. It has been found that the ions of the salts when acting on proteid substances may antagonize one another, one acting as a precipitant, the other as a solvent, and accordingly as the influence of the one or the other ion predominates, the salt concerned causes or hinders the precipitation of albumin. The ions of salts arranged according to their respective value make the following series:

Kations (according to decreasing precipitating power): Natrium, kalium, ammonium, magnesium.

Anions (according to increasing capacity for preventing precipitation): Sulphate, citrate, tartrate, acetate, chlorid, nitrate, bromid, iodid, sulpho-cyanid (or rhodanate).

The salts of the alkaline earth metals differ in their effect from those of the neutral salts of the alkali metals. Thus the salts of the alkaline earth metals bring about a precipitation of albumin that is irreversible in the sense that a precipitation once set in is difficult to inhibit; a return to unaltered albumin is scarcely possible. The effect of calcium, stronium and barium is in high degree variable, according to the presence or absence of other ions. Curiously enough, here the ions composing the alkali salts though opposed to one another in action, have an effect exactly opposite to that observable in precipitation of albumin with the pure neutral salts of the alkalies. Thus precipitation produced by the earth-alkalies is favored by anions and hindered by kations. The anions arranged in order of increasing power of favoring precipitation

4. Cf. Pauli, W. Ueber den Zusammenhang physiko-chemischer Eigenschaften und arzneilicher Wirkung. Vorgetragen auf dem Kongress f. innere Medizin in Leipzig, 1904.

form the series: Acetate, chlorid, nitrate, bromid, iodid, and sulpho-cyanid; kations arranged in decreasing dissolving power form the series: Magnesium, ammonium, kalium, natrium.

But how, it may be asked, can these facts, learned from test-tube experiments, be applied to the study of ion action on the albuminous substances of the protoplasm of living cells? In studying the physiologic effects of the ions of salts, it has been found that the additive and antagonistic effects of ions are similarly observable in the living body. For example, it is a property common to all kations that they increase to a greater or less extent the excitability of muscles and nerves, that they stimulate the activity of the gastrointestinal tract[5], and, usually, they increase the blood pressure. And again, the physiologic effects of anions, like their albumin dissolving power, become more and more marked as the above series is descended; the sulphates, citrates, and tartrates which precipitate albumin also act as purgatives; the other salts, especially the nitrates, bromids, iodids, and sulphocyanids, act, on the contrary, as sedatives and, further, tend to lower the blood pressure. The allied nature of the latter anions is also shown by the production by all of them in certain susceptible individuals of unpleasant complications like acne and coryza. The similarity of behavior of the sulphocyanids to that of the iodids and bromids in experiments *in vitro* led Pauli to expect a similar pharmacologic effect, and his experiments on the treatment of tertiary syphilis with sulphocyanid of soda (*Rhodan-natrium*) have shown that much may be hoped from "rhodantherapy" in some cases.[6] In one patient, with syphilis of the bones of the skull and syphilitic involvement of the sternoclavicular articulation, the administration of small doses of rhodan-natrium led to a rapid recovery.

The sulphocyanid anion or "sulphocyanion" stands at the end of the series of the monovalent anions and appears to be the most powerful of them all. Pauli made an interesting series of experiments to determine the difference in action between the salt, sodium sulphocyanid, and the ester, amylsulphocyanid. In aqueous solution, the salt dissociates into its ions, natrium and sulphocyanion, the ester scarcely if at all. But the ester, by virtue of its solubility in fats, can, as Overton's studies have shown, easily penetrate into the interior of the cells, while the soda salt (or its ions) cannot enter easily. But inside the cells an ester is saponified, so that, from the amylsulphocyanid, sulphocyanic acid would be set free, and as this acid dissociates into its ions, viz.: hydrion and sulphocyanion, it might be expected that the physiologic effect of the sulphocyanion would, under favorable conditions, be obtained. The experiments proved that with both sodium sulphocyanid and amylsulphocyanid, that is to say, with both the salt and the ester, a typical sulphocyanid poisoning can be produced. But the following remarkable observations were made: While two or three drops of the ester given intravenously rapidly killed the animal, to get the same effect from the sodium salt, some eight or ten grams had to be injected. The explanation of the enormous difference in action doubtless lies in the solubility of the ester in the cell lipoids, permitting quick penetration; the ions of the dissociated salt penetrating only with great difficulty into the interior of the cells, a far greater amount of the substance had to be introduced to produce the same effect.

It seems further that substances that act as local anesthetics have anions united in an ester-like combination; as undissociated ester they enter the cells quickly; once inside they are saponified and as the resulting acid dissociates into hydrion and anion, the latter can exercise its anesthetic influence on the sensory nerve-ending. Thus cocain itself is the methylester of benzoylecgonin, one of the tropin-carbonic acids. The acid alone is twenty times less active than the ester. And many other examples might be given.

Mention was made above of the fact that certain ions increase the precipitating power of the alkaline-earth kations, others inhibit it. It occurred to Pauli that the same combinations which *in vitro* increase the precipitation of albumin, ought to increase the toxicity in the animal body; and experiment supported this hypothesis. Thus, for example, the toxicity of an amount of sulphocyanid that would ordinarily have only a slight and temporary effect can be so increased by the exhibition of small doses of salts of the alkaline earths, doses in themselves non-toxic, that the beat of the heart will be suddenly arrested.

The results of the experiments of Loeb, made in an entirely different field namely that of experimental embryology, are so closely in accord with those of Pauli that one can not help but feel that this new path which is being blazed through the forest is sure to lead us to new possessions, the value of which we can as yet scarcely guess. And in making these new possessions accessible to us American investigators, if present indications are an index to the future, are to play no inactive part. In addition to the brilliant experiments of Loeb himself, and those of J. B. MacCallum already referred to, we have the work of Ralph Lillie on the antagonism of the kation effect on the movement of cilia, that of Martin Fischer on the suppression of a glycosuria due to the action of natrium ions by the administration of calcium, that of Brown in which it was shown that the calcium could be replaced by strontium, and that of Sollmann of Cleveland on the effects of other anions on the excretion of chlorin in the urine.

(*To be continued.*)

5. The reader will recall the interesting results obtained by J. B. MacCallum of Berkeley in his study of the mode of action of the saline cathartics.

6. Pauli W., Zur Kenntnis der Rhodantherapie, Centralbl. f. d. ges. Therap., vol. xxii, 1904.

Therapeutics.

[It is the aim of this department to aid the general practitioner by giving practical prescriptions and, in brief, methods of treatment for the diseases seen especially in every-day practice. Proper inquiries concerning general formulae and outlines of treatment are answered in these columns.]

Bronchitis.

The different forms of bronchitis may be classified as follows:

1. Acute bronchitis.
   a. Of the larger tubes.
   b. Of the smaller tubes.
2. Chronic bronchitis.

In making a finer division of the different forms of bronchitis Hoffmann, in "Nothnagel's Encyc. of Med.," enumerates thirteen different forms of bronchitis depending on the etiology rather than on the pathologic basis. Among these is "catching cold." One contracts "a cold," according to Hoffmann, because the body or some part of it suffers a sudden deprivation of heat and fails to react as vigorously as it would under normal conditions. The nervous system is not always sufficiently vigilant and the mechanisms which regulate these changes are not always energetic enough, consequently abnormal conditions arise. So in taking cold, he goes on to state, one can suppose that there is a loosening of the epithelium of the bronchi, with the development of small, thin places, in consequence of this sudden change of temperature, in people who are not properly hardened; as a result dust and micro-organisms penetrate into and cause desquamation of these thinner layers of the epithelium and thus produce a catarrhal inflammation. It must not be overlooked, however, that one individual does not show the same degree of susceptibility that may be shown by another.

TREATMENT.

In regard to internal medication, the author mentions those drugs which act on the respiratory centers as sedatives, such as opium and hydrocyanic acid; and those which act as stimulants, such as belladonna, strychnia, ammonia, ipecacuanha and senega. He also mentions drugs which influence the activity of the glands as sedatives—acids, belladonna, senega and scilla;

and those which stimulate—alkalies, pilocarpin, apomorphin, ipecac and tartar emetic.

Musser recommends the following outline of treatment in those cases of acute bronchitis which begin with a cold and coryza followed by laryngitis and bronchitis. In the beginning a brisk hydragogue cathartic is given, such as elaterium if the patient is robust, or with a full dose of Dover's powder at bedtime and a hot footbath. If there is much headache and frontal pain the following is recommended:

℞. Camphoræ ..... gr. i |06
Ext. belladonnæ ..... gr. i-iss |06-.09
Quin. sulph. ..... gr. i-ii |06-.12
Morph. Sulph. ..... gr. 1/40 |0015

M. Ft. cap. No. i. Sig.: One capsule every half hour for four doses; then every three hours.

If the skin is hot and dry and the patient is restless, one grain (.06) of Dover's powder may be substituted for the morphin. The nares should be well irrigated with an antiseptic solution such as boric acid, or carbolic acid lotions and cocain may be used, if applied carefully, to relieve the congested nares. In cases accompanied by laryngitis, a cold compress should be used at night and an inhalation of benzoin, using the tincture, dram one (4.00) in a pint of boiling water. A purgative and diaphoretic should be employed also, as that is very efficient treatment in these cases. When a bronchitis has developed and when there is a feeling of oppression in the chest, with a tight, dry cough, the following combinations are recommended:

℞. Quin. sulph. ..... gr. i-ii |06-.12
Pulv. ipecac. et opii ..... gr. i |06
Salicin ..... gr. i |06

M. Ft. cap. No. i. Sig.: Two such capsules to be taken at one dose, two in two hours, then one every three hours. Or:

℞. Mist. potass. cit. ..... ℥ii 60|

Sig.: One tablespoonful every two hours. Or:

℞. Pot. iodidi ..... gr. xlv 3|
Vini ipecacuanhæ ..... ℥ii 8|
Misturæ glycyrrhizæ co. q. s. ad..... ℥iii 90|

M. Sig.: One teaspoonful every two or three hours.

The following may, in some cases, have to be resorted to in order to relieve the severe cough and oppression:

℞. Syr. ipecacuanhæ. |
Syr. sanguinariæ. |
Syr. scillæ, ää ..... ℥ii 8|
Syr. pruni virg. q. s. ad. ..... ℥ii 60|

M. Sig.: From one-half to one teaspoonful every two or three hours.

In the moist stage he recommends ammonium chlorid, terpin hydrate and tar preparations combined as follows:

℞. Ammonii chloridi ..... ℥i 4|
Terpin hydratis ..... ℥i 4|
Pulv. opii et ipecacuanhæ ..... gr. xxiv 1|60

M. Ft. cap. No. xxiv. Sig.: One or two capsules, according to age, every two or three hours.

If the cough is easy and the expectoration free, the opiate may be omitted or tar in doses of grains two (.12) may be substituted or the following combination employed:

℞. Ammonii chloridi ..... ℥i 4|
Vini picis liquidæ ..... ℥iss 45|
Syr. glycyrrhizæ co. ..... ℥iss 45|

M. Sig.: Two teaspoonfuls every two or three hours.

If there is venous rather than arterial hyperemia, stimulants such as strychnia and digitalis are of service. Otherwise they may aggravate the condition.

At the onset of a cold leading up to a bronchitis, Dr. R. W. Parsons of Ossining, N. Y., recommends the following outline of treatment:

℞. Spts. camphoræ ..... ℥ss 2|
Aquæ ..... ℥iv 120|

M. Sig.: Shake; two teaspoonfuls every hour until relieved.

He recommends as a spray the following combination containing adrenalin:

℞. Sol. adrenalin chloridi (1-1,000) ..... ℥ii 8|
Sol. sodii chloridi (normal) ..... ℥iiss 75|

M. Sig.: Use as a spray in the nose every hour until relieved. Keep the atomizer in a dark place when not in use.

For patients who reside in cities and for those whose business requires them to travel, the use of a very mild alkaline and antiseptic spray is recommended, to be used twice daily.

In cases of chronic bronchitis with bronchorrhea the following is recommended by Bartholow:

℞. Ext. eucalypti fl. ..... ℥i 30|
Ammonii chloridi ..... ℥ii 8|
Ext. glycyrrhizæ fl. ..... ℥i 30|
Glycerini ..... ℥iii 90|

M. Sig.: One teaspoonful in water four or five times daily.

In some cases he recommends the following as an expectorant:

℞. Tinct. sanguinariæ ..... ℥i 4|
Tinct. lobeliæ ..... ℥i 4|
Vini ipecacuanhæ ..... ℥ii 8|
Syr. tolutani ..... ℥ss 15|

M. Sig.: One teaspoonful every three hours.

Where there is chronic bronchial catarrh with profuse secretion, the following combination is recommended:

℞. Terpin. hydratis ..... gr. xv 1|
Alcoholis ..... ℥iv 15|
Syr. simplicis ..... ℥iss 45|
Aquæ q. s. ad. ..... ℥iv 120|

M. Sig.: Two teaspoonfuls every three hours.

When the cough is dry the following is recommended:

℞. Potass. iodidi ..... ℥ss 2|
Sodii bicarb ..... ℥ii 8|
Ammonii chloridi ..... ℥i 4|
Aq. chloroformi q. s. ad. ..... ℥iv 120|

M. Sig.: One tablespoonful every four hours in water.

A combination of tar and benzoin is of value in cases of chronic bronchial catarrh:

℞. Picis. |
Pulv. benzoini, ää ..... gr. xxx 2|
Pulv. ipecacuanhæ comp. ..... gr. x |65

M. Ft. pil. No. xv. Sig.: One or two pills to be taken three times a day.

In catarrhal conditions confined to the larger bronchi the following combination is of value:

℞. Terpin hydratis ..... gr. iv |25
Heroin hydrochlor. ..... gr. 1/24 |0025

M. Ft. cap. No. i. Sig.: One such capsule four times a day.

In the chronic form of winter cough terebene is recommended, given in capsule form or dropped on sugar, in doses ranging from 5 to 20 minims (.30-1.30), or, as Yeo advises, made into an emulsion as follows:

℞. Terebene ..... ℥ii 8|
Mucilaginis tragacanthæ q. s. ad..... ℥iii 90|

M. Sig.: Two teaspoonfuls four times a day.

It can be used in the form of a spray or on a sponge.

In certain cases of the chronic forms of bronchitis accompanied by bronchorrhea Wilson, in the "Textbook of Applied Ther." states that stimulating expectorants may be useful, but that the majority are rapidly relieved by the "alterative" use of balsams and allied remedies.

Inhalations of atomized mixtures are of value and the following combinations are recommended by this writer:

℞. Acidi gallici ..... gr. xxx 2|
Tinct. opii deod. ..... ℥iv 15|
Glycerini ..... ℥i 30|
Aquæ menth. pip. q. s. ad..... ℥iv 120|

M. and filter. Sig.: Inhale from an atomizer three or four times daily.

Internally the following may be given:

℞. Ammon. chloridi ..... ℥ii 8|
Tinct. opii camph. |
Syrupi senegæ, ää..... ℥i 30|
Syr. tolutani q. s. ad..... ℥iv 120|

M. Sig.: One teaspoonful every three hours, unless asleep. Or:

℞. Copaibæ ..... gtt. xx 1|30
Pulv. opii ..... gr. ii |12
Pulv. acaciæ q. s. |

M. Ft. cap. No. x. Sig.: One capsule every three hours.

In cases of bronchiectasis, where the sputum is expectorated once or twice a day in large quantities and is offensive, antiseptics should be employed. Turpentine should be given in

emulsion in doses of five minims (.30) every three or four hours. Terebene may be given in capsule in doses of five minims (.30) every four or five hours.

Benzoic acid, in doses of five grains (.30), every three or four hours is a very efficient remedy. The intratracheal injection of menthol and guaiacol with olive oil is a well recommended remedy where there is dilatation of the bronchi:

R.	Menthol	3i	4
	Guaiacol	3ii	8
	Ol. olivæ	ʒi-ʒiss	30-45

M. Sig.: Inject one dram into the trachea twice daily.

The idea of "coughing downward" in these cases may prove valuable, directing the patient to lie on the bed with one hand on the floor and the head almost reaching the floor, so that the fluid will run out of the dilated bronchi assisted by coughing.

Preventive Treatment of False Croup.

The *Gaz. Med. Belge* states that a French physician, Dr. Couder of Alençon, advises mothers to wake up their children every hour during the night when they are threatened with false croup. The catarrhal condition causes a viscous, adherent secretion. During the day the secretion is constantly removed by the swallowing and coughing of the child, but at night, during heavy sleep, the secretion becomes dry and hard. The passages are more or less swollen, and the hardening of the secretion obstructs them more and more until the child wakes suffocating. When its breathing becomes sibilant or choked, it should be aroused, set up and coaxed to drink some warm fluid. This softens the secretions and they are swallowed or coughed up, and all trouble from this cause is avoided. It is seldom necessary to rouse the child oftener than once an hour, and not at all after 2 a. m.

Treatment of Whooping Cough.

R. Millon of Paris is amazed at the way in which his confrères generally neglect the treatment of whooping cough. He thinks this is due partially to the saying of J. Franck, long ago, to the effect that "you can kill a whooping-cough child before the affection has run its course, but you can never cure him." This saying elicited from Cadet de Grassicourt the remark that there is nothing more dangerous in medicine than physicians who like to make witty epigrams. Millon treats whooping cough by keeping the patient in his room during the febrile, catarrhal stage, when the paroxysms are progressively frequent. After the paroxysms have reached a stationary phase he allows the patient to leave his room and go out of doors, if the weather is favorable, when the râles have vanished. When the paroxysms begin to subside he advises out-of-door life, strolls and change of air.

R.	Potass. brom.	gr. xxx	2
	Antipyrini	gr. xv	1
	Syr. codeinæ	3v	20
	Syr. tolutani	ʒiv	120

M. Sig.: Dose, one teaspoonful.

Syrup of codein is composed of: Codein phos, gr. xl; aqua, drams 2, and syrup, drams 20.

Antipyrin alone is peculiarly efficient for infants. He has sometimes been able to abort a paroxysm by the Naegeli maneuver, pulling the lower jaw forward. He teaches the child to control the impulse to cough, and he treats the nasopharyngeal inflammation with iodized glycerin or with some other tonic.

Medicolegal.

Questions that May Be Asked Experts in Injury Cases.—The St. Louis Court of Appeals says, in the personal injury case of Holden vs. Missouri Railroad Co., that on examination of an expert concerning a personal injury, a question may be either as to the cause of the injury or condition, or, conversely, what would be the effect on the body of such a force or blow, or, in the presence of a given effect, what would cause it or might result therefrom.

Corporation Not Liable for Services to Employes.—The Appellate term of the Supreme Court says that judgment was rendered in the case of Harris vs. Vienna Ice Cream Co. in favor of the plaintiff, a physician, for professional services rendered to two of the employes of the company, as alleged, "at the special request" of the latter. Granting (which was disputed) that the president and secretary of the company requested the services, and on behalf of the company promised remuneration therefor, the record was without evidence to show that the services rendered were for its benefit or in satisfaction of a claim, if any there might be, against it. Persons dealing with the officers of a corporation, or with persons assuming to represent it, are chargeable with notice of the purpose of its creation and its powers, and with the authority, actual or apparent, of its officers or agents with whom they deal. The contract in suit could not be said to fall within the purpose of the creation of the Vienna Ice Cream Company, nor did the evidence disclose corporate benefit, or authority, actual or apparent, in its president or secretary, to obligate it in the particular instance. Individually liable they might be, but not the corporation whose officers they may be. The judgment must therefore be reversed, and a new trial ordered, with costs to the company to abide the event.

Belief in Future Life is No Evidence of Insane Delusion.—The Supreme Court of Illinois says, in Scott vs. Scott, that the great majority of civilized human beings believe in the existence of a life beyond the grave. The fact that an individual holds any particular belief in regard to a future state of existence can not, of itself, be evidence of an insane delusion or of monomania. An insane delusion is a belief in something impossible in the nature of things, or impossible under the circumstances surrounding the afflicted individual, and which refuses to yield either to evidence or reason. Such a delusion does not exist unless it is one whose fallacy can be certainly demonstrated, for, except such demonstration can be made, it can not be said that no rational person would entertain the belief. Consequently, no creed or religious belief, in so far as it pertains to an existence after death, can be regarded as a delusion, because there is no test by which it can be tried and its truth or falsity demonstrated. It follows, therefore, the court holds with reference to this particular case, that a belief in Swedenborgianism, and enthusiasm manifested in propagating that faith, furnish no evidence of monomania, insane delusion, or insanity.

Use of Mortuary Tables—Proof in Injury Cases.—The Supreme Court of Nebraska holds, in City of South Omaha vs. Sutliffe, a personal injury case brought by the latter party, that, while the Carlisle and other mortuary tables of accepted accuracy and in general use are always properly admissible in evidence for the purpose of aiding a court or jury in determining the probable expectancy of life, when such fact is in issue, yet, when admitted these mortuary tables are not binding on the estimate of the triers of such fact. They may, without such tables, make their own estimate from the age, health, habits, physical condition and appearance of the person whose expectancy is at issue. In actions for personal injuries it is not necessary to specially allege every direct injury to each part of the body, to lay the foundation for such proof on the trial. Such proof may be admitted when the injury alleged is shown to have been the natural and proximate cause of the injury proven. When medical testimony is relied on to prove the cause or effect of a physical injury, it seldom goes further than an opinion based on the experience of the witness and the general learning of the profession. Positive statements of fact are seldom indulged in by physicians when testifying as experts, and yet this character of testimony is universally admitted by the courts of this country.

Proper Questions as to Sudden Development of Diphtheria.—The Second Appellate Division of the Supreme Court of New York reverses, for error in the exclusion of evidence, a judgment for $500 damages in the malpractice case of Purcell vs.

Jessup. When the physician was called in the first instance to see the plaintiff's little daughter she appeared to have been suffering from an attack of the measles. The physician admitted that she died about a week later of diphtheria, "joined to bronchopneumonia and measles." The theory of the plaintiff's case, as presented on trial, was that the diphtheria which caused the patient's death was developed at least two days before she died; that the physician ignorantly or negligently failed to detect the presence of the disease, and that, if he had possessed the knowledge and skill which the law requires on the part of a medical man, and had exercised the same, he could and would have effected a cure. The physician maintained that the diphtheria developed twelve hours before the girl's death, and was first manifest after a visit which he had paid to her on the day previous to the one on which she died, on which latter day he found her in a dying condition, beyond help by any means in his power. A physician and surgeon of thirty years' practice, residing on Staten Island and connected for twenty-five years with the Smith Infirmary, was called as an expert witness in his behalf, and testified, in answer to a hypothetical question, that the treatment of the child was proper and everything that it should have been. After stating that a fatal result, according to the experience of the medical profession, could occur in a case of diphtheria in a period varying from a few hours to days in length, he was asked: "In your opinion and medical experience, is it possible for a child to show no symptoms of diphtheria on one day, and develop a fatal case of diphtheria the next?" This question was objected to, and the objections sustained. The court thinks it quite clear that the evidence which it sought to elicit was material and important, and that the exclusion of such evidence may well have operated to the injury of the defendant. The essential feature of his defense was that the fatal attack of diphtheria had developed within a few hours after he last saw the child before the day of her death, and he insisted that there were no indications of the existence of the malady on the occasion of his previous visit. In accepting or rejecting this defense, the jury might properly be largely influenced by what was proved to have been the experience of the medical profession in regard to the probability or possibility that diphtheria could manifest itself thus suddenly and without previous sign. The question called not only for the opinion of the expert witness on that subject, but also for his actual experience. Both should have been permitted to be laid before the jury. The opinion of a medical man is admissible, as a general rule, on questions peculiarly within his knowledge as such. The witness was certainly competent to give opinion evidence, as well as to state his actual personal experience in regard to the suddenness of the onset in cases of diphtheria, the absence of any signs of the development of the disease preceding such onset, and the rapidity of the progress of the malady to a fatal result after its development. In a case of this character it can not fairly be held that such evidence would not have effect and weight with a jury. It is not difficult to see that, if it had been admitted, it might have relieved the defendant from a verdict which, if allowed to stand, would constitute a permanent injury to his professional standing, inasmuch as it involved the conclusion that a human life had been lost through his incompetency or carelessness.

Current Medical Literature.

AMERICAN.

Titles marked with an asterisk (*) are abstracted below.

American Medicine, Philadelphia.

February 11.

1 *Some Forms of Insanity Due to Alcohol. C. K. Mills, Philadelphia.
2 History and Development of Surgery During the Past Century. (To be concluded.) F. S. Dennis, New York City.
3 *Subcutaneous Alimentation. A. E. Barker, London.
4 *Bezold's Variety of Mastoid Disease Complicating Diabetes Mellitus. S. M. Smith, Philadelphia.
5 *Pneumonia and Pregnancy. R. C. Ransdell, Washington.

1. **Insanity Due to Alcohol.**—Mills discusses the different forms of acute and chronic alcoholic insanity with medicolegal bearings; these including, although in relative degree, almost all types of alcoholic mental disorder. He classes dipsomania with the impulsive insanities, and emphasizes the distinction between dipsomania and inebriety with periods of great excess, and also between dipsomania and other forms of alcoholism.

3. **Subcutaneous Alimentation.**—Barker relates his experience with the use of subcutaneous and intravenous infusions of physiologic saline solution and of glucose, the latter being added as a food. The saline infusion introduces water into the body, dilutes the toxins and increases their elimination. Saline solution may also be made the means of conveying oxygen to the blood directly, thus stimulating the heart in cases of shock. The method is to shake up with warm saline solution about one-tenth of its volume of pure oxygen and to introduce this by puncture into a vein. So far, it has been only a question of supplying water to the tissues, the sodium chlorid being added for the purpose of rendering the solution isotonic with the blood. An almost equally important consideration remains. Is it possible to supply subcutaneously, or intravenously, a fluid which will take the part of a food? Such a fluid should be easily made, easily absorbed and assimilated, and otherwise harmless. Glucose is a food of considerable value; it is easy to procure, is very soluble and, in proper amount, is perfectly safe when injected under the skin. In order that water or sugar may be introduced into the tissues safely, it is necessary to have the solution absolutely sterile. To do this, the substances used must be able to withstand boiling without alteration. The fluid must be first carefully graduated, so that its osmotic tension is actually, or very nearly, that of the blood. A 5 per cent. solution of glucose in pure distilled water will lower the freezing point to —0.56 C, thus making it isotonic with the blood. Such a solution will keep for a considerable time, if sterilized by boiling, but it is best not to trust the sterility of such solutions too much. They should be injected at about blood heat. For injecting the solution, Barker uses a hollow needle of 1 mm. bore, three feet of small-sized rubber tubing attached to it, with a four-ounce glass syringe, without a piston, fixed to the other end. This latter is held about two feet above the patient's bed and is filled with the solution and covered with a piece of sterile gauze. When the tubing and needle are quite full and free from air, the needle is thrust through a fold of skin on the inner aspect of the upper arm toward the axilla and the fluid is allowed to run in, being replaced from above without removing the needle. This method has proved uniformly satisfactory.

4. **Mastoid Disease Complicating Diabetes Mellitus.**—In support of the view that the pathologic process in diabetes mellitus involving the organ of hearing begins as a primary osteitis of the mastoid process, extending secondarily to the tympanic cavity, Smith cites one case. The patient, a male, aged 41, had been suffering from diabetes for one year when he developed severe pain on the left side of the head and mastoid. A swelling developed immediately below the mastoid tip, which gradually enlarged until it reached a point about an inch above the clavicle. Pain never was referred to the middle ear, and there was not at any time swelling or redness over the process. A Schwartze-Stacke operation was done. A large carious opening was found perforating the tip of the mastoid process, and the antrum and superior part of the cells presented the dry, gangrenous or necrotic appearance so characteristic of the diabetic diathesis. The tip was bathed in pus, which covered a mass of foul-smelling granulation tissue. Smith concludes: 1. That aural complications of diabetes mellitus may be manifested by the classic mastoid symptoms without involving the tympanic cavity. 2. That this condition is peculiar to diabetes mellitus. 3. That the term "diabetic ear" should be limited to those cases in which the disease begins as a primary osteitis of the mastoid, or in which primary tympanic involvement and rapid mastoid complications seem simultaneous.

5. **Pneumonia and Pregnancy.**—Ransdell collected 350 cases from the literature and found that the death rate from pneumonia is appreciably higher in the pregnant woman than in the ordinary patient. Abortion takes place in more than half the patients, and the mortality is much higher when abortion does occur than when it does not. The mortality also is higher in the last three months of pregnancy. The causes of death can be attributed to: 1. Diminution in hemoglobin; 2, degenerative changes in the heart muscle; 3, overloading of the right heart and pulmonary circulation after birth. It is evident that the high percentage of abortions is due to accumulation of carbonic acid in the blood.

Boston Medical and Surgical Journal.

February 9.

6 *Case of Chylous Cyst of the Abdomen. M. H. Richardson, Boston.
7 *Active Treatment of Gonorrhea in Its Early Stages. F. J. Cotton, Boston.
8 Glycosuria in Pregnancy. J. M. Jackson and James R. Torbert, Boston.
9 *I. K. I. Method of Sterilizing Catgut. F. W. Johnson, Boston.

6. **Chylous Cyst of Abdomen.**—The symptoms presented by Richardson's patient were those of nervousness and, at times, acute indigestion. Occasionally he could not get his breath, and about a year before his presentment began to have what seemed to be "falling spells," which the family interpreted as choreic manifestations. Over the epigastrium, on both sides, the thorax was much dilated, the fluid pushed out the costal margins in all directions. The abdomen was much distended and contained fluid. A diagnosis of tubercular peritonitis was made and operation was advised. On opening the peritoneal cavity, Richardson came on a white, fragile-walled cyst covered with small blood vessels, most of which ran transversely. The tumor was retroperitoneal, extending up under the liver and to the right, and contained eight pints of a chylous fluid. It was impossible to make out whether the cyst was a dilatation of the receptaculum chyli or one of its tributaries. No dilated lymph vessels were seen. The patient made an uneventful recovery.

7. **Treatment of Gonorrhea in Early Stages.**—Cotton believes that all cases of early acute gonorrhea, except in the presence of some complication such as phimosis or acute folliculitis, do better under active irrigation, and that the organic silver preparations, used in combination with profuse bland irrigations, accomplish definite results by germicidal action.

9. **I. K. I. Method of Sterilizing Catgut.**—Johnson describes his method as follows: Get clean, strong gut that has no odor and is free from fat. Before sterilization each strand should be thoroughly stretched. The gut should be wound on wide reels, if possible, and too much gut must not be put on any one reel, so that the solution will have ready access to the deeper layers of the gut. Before using, the gut should be washed in sterile water—not allowed to soak in it. The reel or spool can then be placed on a sterile sponge or gauze and, when the operation is finished, dropped back into the common jar, to be used at the next operation. The solution used consists of iodin, 1 part; iodid of potassium, sufficient quantity to saturate, and distilled water sufficient to make 100 parts. Gut sealed in tubes in the I. K. I. solution and kept from the light will become friable in about three months. I. K. I. gut should not be used in plastic work in the vagina, as iodin irritates the mucous membrane, making it an excellent culture medium for micro-organisms. The reels used by Johnson are made of papier maché. They can be made of the desired size and notched so that the size wanted can be seen before removal from the I. K. I. solution. The advantages of this method are the absolute certainty of a sterile gut, ease of preparation, healing by first intention and an animal suture material that will not slip and that will tie like silk.

Medical News, New York.

February 11.

10 *Report of a Sporadic Outbreak of Typhoid Fever at Lawrence, N. Y., Due to Oysters. George A. Soper, New York.
11 *Hematuria as a Symptom of Hydronephrosis. Nephrectomy. Cure. L. Bangs, New York.
12 *Two Cases of Tracheal Stenosis from New Growth. George E. Brewer, New York.
13 *Management of Acute General Peritonitis. J. Garland Sherrill, Louisville.
14 Clinical Manifestations of Uterine Fibroids, as Indications for Early Operative Intervention. Arnold Sturmdorf, New York.

10. **Typhoid Epidemic Due to Oysters.**—Soper reports the results of his investigations into the cause of the outbreak of typhoid at Lawrence, N. Y., which was found to be due to the pollution of oyster beds by sewage.

11. **Hematuria in Hydronephrosis.**—Bangs discusses hematuria as a symptom of hydronephrosis. A thorough and careful review of the literature failed to discover any cases of this kind, except in one instance, in a series of 40 cases, among them being 9 cases in which hematuria was a symptom. He adds one case to the list. The patient was a male, aged 19. The presence of blood in the urine was intermittent and variable in quantity, the latter being increased by slight trauma, such as jolting in a wagon and by the manipulations of the kidneys necessary to a diagnosis. It was also suddenly increased by unknown causes, but at no time was there a serious amount of blood in the urine. The Harris separator was used, disclosing that the left kidney was the seat of disease. Based on all the symptoms present, the diagnosis of hydronephrosis was made. The kidney was reached by means of the Mayo-Robson method and was found to contain about a quart of fluid. Comparatively little renal tissue was left. There was a moderately free hemorrhage from the interior of the sac, which was controlled by free irrigation with very hot water. A nephrectomy was not performed until some months later. During the operation the sac bled freely from its interior. The hemorrhage continued free and uncontrollable until the liberated parts of the sac were folded on themselves, and the amount of hemorrhage from the thin and expanded kidney tissue was sufficiently great to cause a very serious condition of collapse. The patient made an uneventful recovery. A small flexible bougie was passed through the ureter to the bladder to demonstrate the absence of any obstruction between the kidney and bladder. At the time of the nephrotomy there was no calculus either in the kidney or its pelvis, and no obstruction of any kind elsewhere. The microscopic appearance of the tissues was typical of hydronephrosis. The etiology of the condition in this case was very obscure. The patient had had unusually good health from his infancy up; there was no history of traumatism; no history of renal colic nor of pain in the left side, and no symptom indicating the beginning of the malady until it was fully developed. Bangs lays special stress on hematuria as a symptom of hydronephrosis and repeatedly calls attention to the degree of hemorrhage during the two operations.

12. **Tracheal Stenosis.**—The two cases of tracheal stenosis reported by Brewer, and which necessitated grave operative procedures for their relief, were a papilloma of the trachea following tracheotomy for the relief of papillomatous degeneration of the laryngeal mucous membrane, occurring in a boy 11 years old, and an adenocarcinoma of the accessory thyroid gland occurring in a man, aged 52.

13. See abstract in THE JOURNAL, Jan. 7, p. 60. (Sherrill.)

Medical Record, New York.

February 11.

15 *Attractive Features of Graduated Tenotomies on the Eye Muscles. A. L. Ranney, New York City.
16 Some Relations of Medicine and Surgery to Jurisprudence. Carl Beck, New York.
17 *Choice of a General Anesthetic and Selection of Method of Administration. V. C. Pedersen, New York.
18 *Cryoscopy of Cerebrospinal Fluid in Epidemic Cerebrospinal Meningitis. J. H. Bailey, New York.
19 *Foreign Body in Bronchus Removed with Bronchoscope; Recovery. S. Yankauer, New York.
20 *Spindle-cell Sarcoma of Bowel Operated on Successfully. J. B. Boucher, Hartford, Conn.

15. **Graduated Tenotomies on Eye Muscles.**—Ranney cites 20 cases illustrating the curative effects that a complete relief of eye strain by graduated tenotomies can afford in many

forms of nervous derangement which had no apparent connection with eyestrain and which had proved to be incurable by drugs. Some of the patients were not aware of the existence of any symptoms that had indicated to themselves or to their medical advisors that the eyes were in any way abnormal. Among the patients treated were cases of asthenopia, associated with repeated physical breakdowns; epiphora of years' duration, extreme deformity from wryneck, epilepsy, insanity, nervous prostration, chorea, followed by paralysis; progressive atrophy of muscles in both hands, with partial loss of use of right hand, and an associated diabetes; complete loss of the intellectual faculties, uncontrollable neuralgia, sleeplessness and nervous prostration; uncontrollable attacks of vomiting, with loss of power and sensation in both arms and a suspected tuberculosis. Ranney urges that it is essential to success that the refractive errors of all patients be positively determined and, when found, that they should be intelligently corrected by glasses. These should be worn constantly for a length of time sufficient to determine if they modify any apparent muscular anomalies in the organ. It often takes considerable time to determine if the full correction of refractive errors by proper glasses is not all that may be required to effect a cure. A tenotomy on an eye muscle should never be suggested nor performed too hastily. It is important not to be misled into accepting the records of the first tests made on any patient's eye muscles as a basis for final conclusions or for positive advice.

17. **Anesthesia.**—Pedersen discusses general anesthesia with regard to the qualities of the substances used to produce the anesthesia and the best method of anesthetizing various types of cases.

18. **Cryoscopy of Cerebrospinal Fluid in Epidemic Meningitis.**—Bailey made a cryoscopic examination of 69 specimens of cerebrospinal fluid obtained from a lesser number of cases of epidemic cerebrospinal meningitis, some of the cases being examined several times at varying intervals. For the sake of convenience, Bailey made use of the following symbols: T, the total freezing point of the cerebrospinal fluid; S, that part of the total freezing point due to the contained sodium chlorid; R, that part of T due to the remaining solid components of the fluid. His findings are as follows: Upper limit of T, —.815; lower limit, —.50; a variation of —.315. The vast majority of cases, 79 per cent., ranged from —.52 to —.64, a variation of only —.12. Average T was —.575, very close to the normal freezing point of blood. T is not of any prognostic significance; some of the patients who recovered showed a high T, others a low T, while the same is true of several cases that terminated fatally. The limits of S were —.352 and —.486, a variation of —.134. Most of the cases, 74 per cent., ranged from —.40 to —.45, a difference of only —.05. Average S was —.422. The limits of R were —.062 and —.338, a variation of —.276. Most of the cases, 72 per cent., ranged from —.090 to —.180, a difference of —.09. Average R is —.152. The limits of the sodium chlorid content were .55 per cent. and —76 per cent. Most of the cases, 71 per cent., ranged from .60 to .68 per cent., a difference of .08 per cent., or, reduced to terms of the freezing point, a difference corresponding to —.05. The average sodium chlorid content was .66 per cent.

19. **Foreign Body in Bronchus.**—Under primary chloroform anesthesia, Yankauer removed an orange pit from the right bronchus of a 10-months-old child. He made an inferior tracheotomy incision and used a bronchoscope having an external diameter of 7 mm. The patient made an uneventful recovery.

20. **Sarcoma of the Bowel.**—Boucher's patient, a woman, aged 38, complained of considerable pain in the abdomen, particularly in the right inguinal region. Examination revealed a mass four or five inches long in the right inguinal region, about one inch to the outer side of the appendix line and attached to the crest of the ileum. The diagnosis of a probable malignant growth was made and operation was resorted to. The tumor involved the cecum and several inches of the ascending colon. The glands in the neighborhood were enlarged, some being as large as an ordinary marble. Six inches of the small intestine, all of the ascending and about one-half of the transverse colon were clamped off and removed, including every gland that could be found. The end of the transverse colon was turned in, by a double Lembert suture of silk, and an anastomosis was made between the cut end of the small intestine and the side of the middle portion of the transverse colon, for which silk sutures were used. The abdomen was closed without drainage. Microscopic examination of the specimen showed it to be a spindle-cell sarcoma. Recovery was uninterrupted, and there is no recurrence one year after the operation.

New York Medical Journal.

February 11.

21 Diagnosis of Tumors of the Cerebellum and the Cerebellopontile Angle, Especially with Reference to Their Surgical Removal. Charles K. Mills, Philadelphia.
22 The Cerebellar Seizure (Cerebellar Fits) a Syndrome Characteristic of Cerebellar Tumors. Charles L. Dana, New York City.
23 Surgical Aspects of Tumors of the Cerebellum. Charles H. Frazier, Philadelphia.
24 Pathology of Cerebellar Tumors. (To be concluded.) T. H. Weisenburg, Philadelphia.
25 Diagnosis of Cerebellar Tumors. Joseph Fraenkel, New York City.
26 Ocular Symptoms of Cerebellar Tumor. G. E. de Schweinitz, Philadelphia.
27 Functions of the Cerebellum. Edward Lodholz, Philadelphia.
28 Case of Cyst of the Cerebellum. John M. Swan, Philadelphia.

St. Louis Medical Review.

February 4.

29 Diagnosis of Jaundice in Infancy and Childhood. W. L. Johnson, St. Louis.
30 Symptomatology of Acute Gastroduodenitis. Geo. M. Tuttle, St. Louis.
31 Recent Experiences with Catarrhal Jaundice. H. N. Chapman, St. Louis.
32 Etiology of Gastroduodenitis in Children with Special Reference to the Recent Epidemic. John Zahrosky, St. Louis.
33 Hydatid Cysts of the Liver. (Concluded.) Neill MacPhatter, New York City.

Lancet-Clinic, Cincinnati.

February.

34 How Sanitation May Be Made Effective. H. G. Graham, Chicago.
35 Diagnosis of Ectopic Gestation. M. A. Tate, Cincinnati.
36 Fracture of the Base of the Skull in a Pregnant Woman, with Recovery and Without the Occurrence of Abortion. M. Dreyfoos, Cincinnati.
37 Distoma Hematobium. A. Faller, Cincinnati.
38 Physiology. C. M. Wright, Cincinnati.

American Journal of Obstetrics, New York.

February.

39 Pathologie Anatomy and Pathogenesis of the Toxemia of Pregnancy. James Ewing, New York City.
40 *Eclampsia, with Report of Cases. L. M. Allen.
41 Treatment of Obstetric Hemorrhages. George L. Brodhead, New York.
42 Pyelitis Complicating Pregnancy. Alfred Baker Spalding, San Francisco.
43 Typical Case of Tubercular Peritonitis. W. P. Manton, Detroit.
44 Three Specimens of Exencephalia. Henry F. Lewis, Chicago.
45 *Some Conclusions After Operating for Two Years on the Pelvic Diseases of Insane Women. LeRoy Broun, New York.
46 Pelvic Inflammation. A Discussion on One of the Most Questions Relating Thereto. L. H. Dunning, Indianapolis.
47 *Fibroid Tumors and Pregnancy. S. Marx.
48 *New Operation for Cystocele. James C. Wood, Cleveland.

40. **Eclampsia.**—Allen presents a statistical study of 33 cases of eclampsia (active) and 10 cases of severe toxemia of pregnancy, occurring in 3,400 confinements. He concludes that eclampsia is due to a toxin, which very probably has its origin in the liver, and comes from the mother rather than from the fetus. Premonitory symptoms are always present, the most constant and important of these being frontal headache. The diagnosis of toxemia of pregnancy should be made early, and if the patient is under observation this can generally be done. The premonitory symptoms should be treated until in spite of the treatment they get worse; then empty the uterus, as in some cases this is the only method of stopping the progress of the disease. Deliver as quickly as possible, consistent with cleanliness and preservation of soft parts, bleed, removing from 300 to 700 c.c., as

the case may indicate; infuse from 500 to 1,000 c.c. of salt solution, depending on the amount of blood withdrawn and the character of the pulse; this may be repeated later; morphia ¼ grain, hypodermically, to relax the muscular system; croton oil, 1 to 2 drops in 1 to 2 drams of olive oil, followed by magnesium sulphate, ½ ounce, in saturated solution, until effectual as a purgative. Other conditions are treated symptomatically. The diet should be liquid, largely milk.

45. **Gynecologic Operations on the Insane.**—Reviewing the histories of the insane patients operated on within the last two years, Brown finds that among those in whom pathologic pelvic conditions existed which were remedied within six months after the commencement of their mental disturbance, improvement in the mental condition was noted in 65 per cent. Under the same conditions, but when the operations were done after one year of mental disturbance, there was an improvement in only 27 per cent. of the patients.

47. **Fibroids and Pregnancy.**—Marx says that every fibroid recurring during the child-bearing period, with few exceptions, should be attacked by surgical means. If occurring during pregnancy, safe fibroids, that is, those beyond the dilating zone of the uterus, should be carefully watched. Every complication during pregnancy depending on the fibroid should warrant our attacking the condition surgically, or at least provoke the indication for emptying the uterus. During labor, safe tumors need watching. The resultant complications must be met energetically, but gently, as they arise. Tumors which can not be displaced blocking the bony passage, warrant vaginal enucleation or cesarean section followed by hysterectomy. Sloughing and necrosis of a puerperal fibroid must not be mistaken for retained secundines. This doubt must be eliminated by exploration with the clean, aseptic hand. Retained secundines are always to be removed manually, and under no condition must the curette be employed, because of the danger of laceration of the capsule and consequent sepsis. Sloughing and necrotic fibroids should always be removed either by enucleation or by hysterectomy.

48. **New Operation for Cystocele and Perineorrhaphy.**—Wood describes his operation as follows: The ordinary circular denudation is made, which should correspond in size to the size and degree of prolapse of the cystocele. While in conformation it should be oval, ordinarily it should be wider above than below, because in nearly all instances there is a greater degree of relaxation in the upper part of the vagina than in the lower. After the denudation is made, the mucous membrane is dissected from the bladder to the extent of three-eighths of an inch entirely around the denuded area. The dissection can be made either with a scalpel or with scissors. Mattress sutures are now passed in such a way that when tied they will make a bridge of tissue three-eighths of an inch in depth, and which is composed of the dissected mucous membrane lifted from the bladder. The edges of this column of tissue are brought together with a running catgut suture. If there is a urethrocele, or if there is incontinence of urine because of weakness at the internal meatus, the dissection is extended along the urethra for a sufficient distance to support the neck, as well as the base, of the bladder. When the uterus is entirely without the vagina, it is absolutely imperative to narrow the vaginal wall; this to be supplemented by the necessary cervical work and reparation of the pelvic floor. In order to overcome relaxation of the pelvic floor, Wood has modified the ordinary flap-slitting operation as follows: A semicircular incision is made with elbowed scissors, the incision extending through the several layers of fascia. The flaps are caught in forceps, one above and one below, and the dissection is completed with the finger well into the crest of the rectocele. If now a suture is passed, beginning at the crest of the rectocele, first through the vaginal flap and buried in the tissues from left to right, being brought out and reintroduced as often as may be necessary to complete the circumference of the wound, and finally brought out at the point of entrance, when tied it will necessarily bring the divided levator ani fibers together in the median line. From one to three vaginal sutures thus introduced will convert the vagina into a mere slit in the pelvic floor. The last suture is introduced within three-fourths of an inch from the vaginal orifice. The vaginal flap should be kept tense while these sutures are being passed, so that the posterior vaginal wall will be perfectly smooth when the operation is completed. The superfluous tissue is removed from the upper and lower angles of the wound. By doing this, all scar tissue is done away with, and the perineum is left smooth, with its surface slightly depressed. The wound may be closed from the perineal aspect as the operator elects. Wood uses interrupted catgut sutures, which, he believes, approximate the fascia and muscles better than does the buried suture. If care is taken not to tie the external sutures too tightly, there is but little pain and no sloughing.

Annals of Surgery, Philadelphia.

February.

49 *Acid Intoxication; Its Significance in Surgical Conditions. James A. Kelly, New York City.
50 *Gall-bladder and Biliary-duct Surgery. D. A. K. Steele, Chicago.
51 Volvulus of the Jejunum. Charles L. Scudder, Boston.
52 *Operations on the Lower Ends of the Ureters by the Inguinal Extraperitoneal Route Under Local Anesthesia (Cocain). John A. Sampson, Baltimore.
53 Primary Urethral Calculus. With Report of a Case. Herman E. Wolf, Chicago.
54 *Case of Bone Transference. Use of a Segment of Fibula to Supply a Defect in the Tibia. Thomas W. Huntington, San Francisco.
55 Contrecoup Fracture of the Sternum. George De Tarnowsky, Chicago.
56 Fracture of the Carpal Scaphoid, with Habitual Dislocation of the Central Fragment. Raymond Russ, San Francisco.
57 *Interscapulothoracic Amputation. Report of Operation for Sarcoma of the Humerus. Farrar Cobb, Boston.
58 Symmetrial Inflamamtion of the Epiphyseal Beak of the Tibia. Kenelm Winslow, Seattle.

49. **Acid Intoxication.**—Kelly's report is based on the observation of about 400 surgical cases. The urine of each of these cases was examined immediately on entrance to the hospital, again within from 12 to 48 hours after the administration of a general anesthetic, again if at any subsequent time clinical signs suggested this condition, or if the urine showed the presence of acetone or diacetic acid; and, finally, the urine was examined in most cases every other day until the clinical symptoms had ceased and until it no longer contained a pathologic amount of acetone or diacetic acid. Of the 400 cases observed symptoms of acid intoxication were present in 46. The test used for determining the presence of acetone is as follows: To 5 c.c. of urine add a crystal of sodium nitroprussiate and sufficient sodium hydrate to render the solution strongly alkaline. This is thoroughly shaken up in a test tube. On the addition of glacial acetic acid, the presence of acetone is shown by the occurrence of a purple color to the foam. The presence of diacetic acid is shown by a Burgundy red color appearing on the addition of a strongly aqueous solution of a ferric chlorid to the urine. Of the 46 cases, acetone and diacetic acid, separately or combined, were found in the following conditions: 11 cases of appendicitis, 14 of contusions and fractures, 2 of gastric disease, 2 of carcinoma, 3 of severe lacerated contused wounds, 2 of localized septic processes, 2 of cerebral concussion, leach of salpingitis, acute multiple suppurative osteomyelitis, floating kidney, fecal fistula and enterocolitis, epilepsy, tuberculous cervical noditis, burns and typhoid fever, diabetic gangrene, hemorrhoids, and alcoholism. In 17 cases symptoms were present on entrance; in 12 cases, within from 24 to 48 hours after the administration of a general anesthetic (ether being used in 10 cases and nitrous oxid in 2 cases); in 17 cases symptoms developed later without any anesthetic being administered and for which no cause could be assigned. Acetone and diacetic acid were present in the urine at the same time in 24 cases; acetone alone was present in 20 cases; diacetic acid alone in 2 cases; acetone, diacetic acid and sugar were present together in 3 cases; ecetone and sugar in one case. In these 46 cases

there were 6 deaths. In those cases where the onset could be carefully noted, the first symptom to attract attention was a peculiar apathy. This was accompanied by a peculiar, pungent, fleeting odor to the breath, a distaste for food, slight increase of body temperature, and, in most cases, vomiting, occurring without apparent cause, following immediately on taking anything into the stomach. In the mild cases the vomitus was colorless, copious and watery in character, having a foul acid odor and containing particles of semi-digested food. In the severe cases it was dark, bile-stained, of a coffee-ground appearance, and continued so until death. In the severe cases, bicarbonate of soda was given by mouth; if retained, by enemata, subcutaneously and intravenously, but usually without avail. The best results were obtained by the use of adrenalin chlorid, given subcutaneously (in children about 200 c.c. of a 1 to 50,000 solution; in adults, 500 c.c. of the same solution) every 8 to 12 hours. To relieve thirst, enemata of salt solution were given every six hours, alternating with nutrient enemata. Kelly says that it has been proved experimentally that this condition is not due to acetone circulating in the blood and that the amount of acetone found in the urine is no index of the severity of the affection. That there is some toxemia occurring is doubtless true, but whether it is due to the presence of volatile fatty acids, with a rapid destruction of proteid matter, or to the rapid elimination of the alkalies, is impossible to say at the present time.

50. **Gall-Bladder and Biliary-Duct Surgery.**—Steele cites 7 cases to illustrate the dangers of delay and the complications that arise from postponing a necessary surgical operation to a time when it is done as a last resort.

52. **Operations on Lower Ends of Ureters.**—Sampson advocates local anesthesia in operations on the ureters. In 4 operations on the lower ends of the ureters by the inguinal extraperitoneal route under local anesthesia (three ureterovesical implantations and one case of ureteral calculus), lasting from 4 hours and 30 minutes to 6 hours and 10 minutes, the only apparent effect of the operation, aside from postural discomfort, and, at times, some pain (endurable), was that of fatigue, as of a similar length of time spent in a dentist's chair. Sampson declares that the success of these operations is dependent on a knowledge of what does and what does not hurt, and on proceeding slowly and carefully, remembering that anything causing traction on the parietal peritoneum is painful. Pinching, cutting, and suturing the ureter apparently did not cause any pain, and similar treatment of the bladder in one case was painless, but painful in another, a case of chronic cystitis. Closing the abdominal incision was the most painful step in all the operations. The extraperitoneal route is less painful than the intraperitoneal and the danger from infection is less; by draining freely, the retroperitoneal tissue is well protected and the intestines are kept back by the peritoneum, thus giving a good exposure. There is less shock associated with the extraperitoneal than with the intraperitoneal operation. The intramuscular incision through the abdominal wall is recommended; it does less harm, renders the liability of postoperative hernia small, and affords a good exposure. Two incisions are very good; first, a "gridiron" incision, lateral to the rectus, similar to the well-known McBurney incision, only a little lower; and, second, a longitudinal incision through the rectus muscle. Through either incision the ureter can usually be exposed from the pelvic brim to the bladder, and if more room is desired the muscles may be cut at any time.

54. **Bone Transference.**—Huntington cites the case of an acute infectious osteomyelitis of the tibia in a boy, aged 7, which illustrates the possibility of supplying a tibial defect amounting to absence of nearly the entire diaphysis by the appropriation of a corresponding portion of the fibula.

57. **Interscapulothoracic Amputation.**—Cobb's case of sarcoma of the humerus is interesting because of the great rapidity of the growth, the associated pain, the complete absence of surgical shock, and the successful immediate result and the disappointing ultimate result. The arm, with the scapula and the outer two-thirds of the clavicle, was removed under ether anesthesia. Shock was prevented entirely by controlling the hemorrhage so that practically no blood was lost, and by adopting the method of Crile and Cushing of injecting a weak solution of cocain into the large nerve trunks of the brachial plexus before dividing it. The inner third of the clavicle was left because there was no apparent reason for disarticulation at the sternal joint. The subclavian artery was ligated and divided between the ligatures; the arm was then elevated to empty it of blood, and then the vein was tied and divided, thus avoiding any hemorrhage. All other blood vessels were clamped and ligated. The skin flaps were sewed with interrupted silkworm gut stitches, and a small rubber tissue drain was placed in the lowest angle of the incision. The duration of the operation was 1 hour and 15 minutes. The patient made a complete recovery, and on the fifth day was up, walking about the ward. The rubber tissue drain was removed in 48 hours. Eight months later the patient returned, suffering from pleurisy with bloody fluid, beyond a doubt of malignant origin. He died nine months after the operation from recurrence of the pleurisy and suspicious cerebral symptoms.

Illinois Medical Journal, Springfield.

January.

59 *Modification of the Porro Operation. Carl Wagner, Chicago.
60 *Duty of the Medical Profession in Relation to Criminal Abortion. C. S. Bacon, Chicago.
61 *The Moral and Religious Objections to Inducing Abortion. Peter J. O'Callaghan.
62 *Therapeutics and Criminal Abortion. Charles B. Reed.
63 Criminal Abortion; Brief Consideration of Its Relation to Newspaper Advertising. Report of a Medicolegal Case. Rudolph W. Holmes.
64 *Criminal Abortion as It Comes Before the Coroner's Office. John E. Traeger, Chicago.
65 *The Common and Statute Law of Illinois. J. M. Sheean, Chicago.
66 Surgical Treatment of Idiopathic Pruritus Vulvæ. M. R. Barker, Chicago.
67 The Present Status of the General Practitioner. T. N. Rafferty, Robinson, Ill.
68 Appendicitis from the Standpoint of the General Practitioner. H. N. Rafferty, Robinson, Ill.
69 The Present Epidemic of Smallpox in Terre Haute. M. R. Combs, Terre Haute, Ind.
Philadelphia.
70 Preventive Medicine. C. Barlow, Robinson.
71 Attention to Details. C. E. Price, Eaton.
72 Neurasthenia. H. I. McNeil, Newman, Ill.
73 Milk Sickness. J. W. Alexander.
74 Plea for More Careful Study of the Kidney. James Miles, Merom, Ind.
75 E Rebus et Rationae Medinae Usus. Joe. H. Weinstein, Terre Haute, Ind.

59. **Modification of Porro Operation.**—Wagner's modification means the reversal of the two steps of the original Porro operation, and consists in the reduction of the cesarean section and the supracervical amputation into one operation of amputation of the intact pregnant organ with everything left in situ as far as the mother is concerned. The amputation is the only operation done on the mother. The delivery of the uterus is an act of its own, done at another table by other hands, and thus not interfering with the operation done on the mother nor consuming extra time on the patient under anesthesia. Another feature of his modification relates to the technic. Instead of placing a rubber tube constrictor around the supracervical segment of the uterus, and tying the uterine arteries before the amputation takes place, the cervical segment is grasped from behind with the left hand and firmly compressed, the segment itself being elongated and made thinner through lifting up and traction of the uterus by an assistant. In this manner the cervical segment is constricted and hemorrhage is controlled absolutely. The slipping of the stump out of the grasp of the hand is guarded against by four forceps inserted into the wall of the uterus at four different diagonal and rectangular points above the constricting pad. The technic of the amputation is as follows: An opening is made in a transverse direction right above one of the forceps. Two fingers of the assistant are introduced into this opening from above downward and inward, the palmar aspect of the hand being

in contact with the uterus in such a way as to enable the assistant to hold backward and upward the contents of the uterus, in order to prevent them from prolapsing or from being injured during the following steps of the operation. The amputation is completed with quick, heavy strokes of the curved scissors held at such an angle as to form a conical shape of the stump. The absolutely dry stump, still in the firm grasp of the hand, is rapidly sewed up, the first running sutures comprising the uterine arteries, the lumen of which can be seen very readily. By not ligating these arteries any sooner, the circulation and nutrition of the child are maintained as long as possible. The uterus is then quickly removed and delivered. The time consumed from the moment the circulation is interrupted until the delivery amounts to something over two minutes.

60. See abstract in THE JOURNAL, vol. xlii, p. 1889.

61, 62 and 64. Ibid, p. 1890.

65. Ibid, p. 1891.

Journal of Cutaneous Diseases, New York.

February.

76 *Melanoma. (Concluded.) J. C. Johnson, New York City.

76. **Melanoma.**—Johnson finds that the commonest, and therefore most important, melanoma is that derived from soft nevi which are endotheliomata of lymph vessel origin, and that nevi melanoma whose histogenesis can not be determined must be referred to the same origin. A second variety exists with the same histologic pictures which does not spring from nevi and whose origin is directly traceable to endothelium, probably also lymphatic. This group includes melanotic whitlow and the malignant lentigo of the French. A third division is truly epithelial in origin, although its existence has been denied. These tumors are of various types and show only a very slight local tendency to malignancy, a fact sufficient in itself to determine a cardinal difference from the melano-entheliomata, whose capacity in this connection can hardly be exaggerated. A histologic diagnosis is the only proper method of differentiation between the two. So far as treatment is concerned, Johnson states that there is hope in surgical interference if it is early and radical, even when dissemination has already occurred locally. The wounds should not be allowed to granulate, not only because granulation tissue offers so slight a bar to tumor growth, but because there is no means of knowing that its endothelium may not join in the neoplasia. Cases of nonrecurrence after operation are reported, the oldest being a case of ligation of a mole on the neck with tumor infiltration of the intermuscular septa in every direction; the patient is entirely well, five years after operation.

American Journal of the Medical Sciences, Philadelphia.

February.

77 *Copious Water Drinking and Polyuria in Typhoid Fever. Edward F. Cushing and T. W. Clarke, Cleveland.
78 *Chlorid and Water Excretion in Typhoid Fever, with Copious Diuresis. Torald Sollmann and J. A. Hofmann, Cleveland.
79 Studies on the Basophilic Granulations of the Erythrocyte in Lead Poisoning and Other Conditions. W. B. Cadwalader, Philadelphia.
80 Toxemia of Pregnancy. Edward P. Davis, Philadelphia.
81 *Hemorrhages in Eclampsia. R. W. Lobenstine, New York City.
82 Myxedema Associated with Tuberculosis of the Adrenals. J. R. Hunt, New York City.
83 Case of Multiple Cerebrospinal Sclerosis. F. E. Dercum and Alfred Gordon, Philadelphia.
84 Case of Infective, Lateral, Sigmoid, Superior Petrossal Sinus and Jugular Thrombosis. J. D. Richards, New York City.
85 Posterior-Basic Meningitis. H. Koplik, New York City.
86 Use of the Roentgen Rays in the Studies of Normal and Pathologic Anatomy of the Internal Structures of the Face. M. H. Cryer. Philadelphia.
87 Development of the Accessory Sinuses of the Nose. L. A. Coffin, New York.
88 Case of Parinaud's Conjunctivitis. W. C. Posey, Philadelphia.
89 Study of Simultaneous Contrast Color Images. C. A. Oliver.
90 Case of Bitemporal Hemianopsia with Unusual Changes in the Visual Fields. C. A. Veasey, Philadelphia.
91 Typhoidal Insanity in Childhood. D. L. Edsall, Philadelphia.

77. **Water Drinking and Polyuria in Typhoid.**—Cushing and Clarke report on the results they obtained in prescribing large quantities of water to typhoid patients. It was soon found that without discomfort or special reluctance on the part of most patients, the unexpected and unusual amounts of from a gallon to a gallon and a half or even more could be taken in 24 hours, providing the water was administered in small quantities, four ounces, at definite and frequent intervals, every fifteen minutes during the waking hours. In addition to this, the ordinary patient received, every two hours during the day and once or twice at night, alternately, six ounces of milk and six ounces of albumin water. The resulting diuresis was marked, the degree of polyuric, day by day, closely corresponding to the quantity of fluid ingested. Furthermore, the total nursing care of these patients was less than of those not so treated, and their general comfort seemed apparent. Headaches were not so troublesome; tongues and mouths kept noticeably clean and moist; apathy, deafness, restlessness, nocturnal delirium and other nervous and toxemic symptoms seemed less in evidence; hypnotics were not so often needed; nausea was unusual, and remission from temperature appeared more frequent. Complications were few, and there were no deaths among 56 cases so treated, although the prevailing epidemic was of severe type and the general mortality, on the whole, was large.

78. **Chlorid and Water Excretion in Typhoid.**—Sollmann and Hofmann investigated the urine secretion in typhoid as influenced by unusually large diuresis, the consequence of a very free administration of water. They found that the free administration of water to typhoid patients causes a large polyuria. The percentage of chlorids and the total molecular concentration are much below normal, while the daily excretion of total dissolved molecules exceeds that of ordinary typhoid cases. Therefore, the eliminating capacity of the kidneys is not injured by typhoid fever nor by a prolonged diuresis. No accumulation of fluid appears to occur in the body, the excretion being very nearly parallel to the income. The quantity of urine is influenced by the perspiration and to a lesser extent by catharsis. It appears probable that the perspiration is freer under the influence of the large administration of fluid. Diuretics do not increase the polyuria nor does the administration of calcium chlorid appear to diminish diuresis. The effect of the polyuria on the chlorid excretion, as compared with ordinary typhoid cases, consists in a diminution of the percentage and an increase of the amount excreted daily. Minor variations in diuresis affect the percentage, but not the daily output. The chlorid excretion varies strictly with the chlorid income. The excretion of water and chlorids appears to obey the same laws as in health. There is, however, a greater tendency to chlorid retention in the fever. The difference appears to be only quantitative and not qualitative. It is greatly diminished by polyuria. The prolonged restriction of the chlorid income appears to produce no deleterious effects, and the patients do not develop any "salt hunger."

81. **Hemorrhages in Eclampsia.**—Lobenstine analyzed the reports of 6 cases of eclampsia with hemorrhagic manifestations and found that the following group of symptoms was quite characteristic of that type of eclampsia: 1. Profound toxicity. 2. Constant and marked jaundice. 3. Prominent, early and distressing abdominal distention—a bad sign in all these cases. 4. Vomiting of clear fluid or curdled milk; then of bile, and finally of coffee-ground material or of clear blood. 5. Pain and tenderness over the liver. 6. Hemorrhagic manifestations other than the vomiting of blood. The prognosis of this affection is bad; mortality, 70 per cent.

Maryland Medical Journal, Baltimore.

February.

92 Dysentery, with Special Reference to Its Bacillary Form. Joseph J. Kinyoun, Glendolen, Pa.
93 Pathology of Epilepsy. Wm. Rush Dunton, Jr., Townson, Md.

Canada Lancet, Toronto.

January.

94 Intra-abdominal Anastomosis. A. Groves, Fergus, Ont.
95 Operative Treatment of Spina Bifida. E. R. Secord, Brantford, Ont.
96 The Decline of Atropin. G. Sterling Ryerson.
97 Patent Medicines. C. J. Fagan, Victoria.
98 Supposed Case of Glanders in the Human Subject. James H. Richardson.

Woman's Medical Journal, Toledo.

January.

99 Preventive Gynecology. Jeannette C. Wallace, Peoria, Ill.
100 Endometritis. Ella G. Lupton, Gallipolis, Ohio.
101 Insanity of Pregnancy and the Puerperium, with Reports of Two Cases. Mary E. Cadwalader, Dayton.
102 Phimosis with Leucorrhea "of Four Years' Standing," in a Child of Six Years. Mary E. Bates, Denver.
103 The Law of Rape in Colorado. Mary E. Bates.

Buffalo Medical Journal.

February.

104 Paranoia as It Relates to Homicide. James W. Putnam.
105 Essential Medication in Cardiac Diseases. Eli H. Long, Buffalo.
106 Consideration of the Advisability of Athletics in Professional Colleges, with Special Reference to the University of Buffalo. Burton T. Simpson, Buffalo.
107 Empyemas of the Accessory Cavities of the Nose in Children. B. Panzer.

St. Louis Courier of Medicine.

January.

108 Baby Incubators on the "Pike," Louisiana Purchase Exposition. (Continued.) John Zahorsky, St. Louis.
109 Electricity as a Curative Agency in Gynecology and Oncology. G. Betton Massey, Philadelphia.
110 Chronic Skin Diseases. Robert M. Sterrett, New York City.
111 Chewing Gum in Typhoid. Geo. Richter, St. Louis.

Pennsylvania Medical Journal, Athens.

January.

112 Address in Obstetrics, Medical Society of the State of Pennsylvania. X. O. Werder, Pittsburg.
113 *Address in Hygiene and State Medicine, Medical Society of the State of Pennsylvania. A. C. Abbott, Philadelphia.
114 Glimpses of Autointoxication. Edwin W. Moore, Franklin.
115 *Modern Methods for Combating Deformity in Spinal Caries. David Silver, Pittsburg.
116 Anal Fissure. William M. Beach, Pittsburg.
117 Treatment of Internal Hemorrhoids by the Injection Method. Lewis H. Adler, Jr., Philadelphia.
118 *Tympanites. J. C. O'Day, Oil City.
119 *Blood Analysis. J. M. McNall, Wilkinsburg.
120 *Knee Ankyloses. De Forest Willard. Philadelphia.
121 *Some of the Unsettled Questions of Extraunterine Pregnancy. Mordecai Price, Philadelphia.
122 *Retrodisplacement of the Uterus; an Experience of 11 Years in Its Treatment, with the Report of a Statistical Study of 465 Cases Operated on by a Method of Ventrosuspension. Henry D. Beyea, Philadelphia.
123 *Symptomatology and Treatment of Influenza. Samuel Wolfe, Philadelphia.
124 *Pneumonia. John R. McCartey, Fredonia.
125 Rheumatism. John C. Kelso, Canonsburg.
126 Puerperal Infections. Clifford Marshall, Sharon.

113. See abstract in THE JOURNAL, vol. xliii, p. 1162.

115. Ibid., p. 1330; 118 and 119. Ibid., p. 1249.

120, 121 and 122. Ibid., p 1330; 123 and 124. Ibid., p. 1249.

FOREIGN.

Titles marked with an asterisk (*) are abstracted below. Clinical lectures, single case reports and trials of new drugs and artificial foods are omitted unless of exceptional general interest.

British Medical Journal, London.

January 28.

1 Suppurative Frontal Sinusitis; Its Surgical Treatment, Based on an Analysis of 40 Cases. W. Milligan.
2 Causes, Symptoms and Complications of the Diseases of the Nasal Accessory Sinuses in Their Relation to General Diseases, Ophthalmology and Neurology. Siegmund Moritz.
3 Diseases of the Nose in Their Relationship to Pathologic Conditions of Other Organs. Adolph Bronner.
4 *Nasal Disease as a Cause of Headache. A. L. Whitehead, Leeds.
5 A Note on Rhinitis Caseosa. Arthur Edmunds.
6 Chronic Suppurative Otitis Media; the Necessity of Early, Systematic and Energetic Treatment. Henry Smurthwaite, Newcastle-on-Tyne.
7 *Treatment of Post-nasal Adenoids. John Ward Cousins.

4. **Nasal Disease and Headache.**—Whitehead concurs in the belief that nasal disease is undoubtedly the cause of headaches in a certain percentage of cases, but thinks that it is doubtful whether it is possible for headaches to be produced by any nasal condition which does not give rise to discharge or to obstruction to normal nasal respiration. In all cases of persistent headache, a careful examination of the nose should be as much a routine practice as the examination of the urine, the teeth, and the eyes, since, in some instances, the nasal symptoms may be ignored by the patient, and a careful examination of the nose will be necessary to establish the diagnosis. Suppuration in the accessory sinuses and marked nasal obstruction, constant or intermittent, should be thoroughly treated. Small spurs, deviations and hypertrophies not causing obstruction should be left alone, as no relief will be given from the headaches by treatment of these. If the middle turbinate bones are enlarged and pressing on the septum, especially on the tubercle, and if all other possible causes of headache have been eliminated, partial removal of the hypertrophied bone should be advised, since in many such cases, complete relief is given.

7. **Treatment of Postnasal Adenoids.**—Cousins says that for children the best instrument for removing adenoids is the sterilized finger nail, as it can be safely employed both to define and to remove the growths in the obscure recesses of the nasopharynx, guided by the sense of touch. He makes use of a mouth gag consisting of a short rod of hard wood carrying a wooden ring to regulate its insertion between the teeth, and with one end larger than the other to suit the capacity of the different mouths. The operator's forefingers are protected by metal rings. Nasal probes, made of flexible metal, are used to clear the posterior nasal apertures. After preparing the patient by the frequent application of some deodorizing mouth wash, Cousins carefully examines the teeth and removes any loose tooth before the introduction of the gag. Whatever anesthetic is employed (he prefers the A. C. E. mixture or chloroform) only enough should be given to arrest corneal sensibility, and it always should be stopped short of suspending the reflex actions of coughing and swallowing. As soon as the patient is ready, the head is brought well over the edge of the table and is supported by the hands of a nurse or by the arm of a surgeon; at the same time, the shoulders are raised on a pillow. The nasal probes are passed through the inferior meatuses into the pharynx; the gag is fixed in the right angle of the mouth and the left forefinger is introduced into the pharyngeal fossa, and with it the sides and roof of the eustachian orifice and the posterior nasal apertures are rapidly cleared. The gag is then shifted to the left angle of the mouth and the operation is repeated on the right side with the right forefinger. After clearing away the adenoids, he excises the tonsils, if they are unhealthy and enlarged. As a general rule, rest and light and soft food are ordered for a few days.

The Lancet, London.

January 28.

8 Myelopathic Albumosuria. C. W. Paget Moffatt.
9 Case of Encysted Cerebral Abscess. Peter Paterson.
10 *Reseaches Into the Etiology of Carcinoma; the Presence of Plasmodiophoræ in Carcinomatous Tumors and the Successful Culture of the Parasites. W. Ford Robertson and Henry Wade.
11 Results of Two Cases of Injection of Paraffin. F. C. Wallis.
12 *Relation Between Various Atmospheric Conditions and the Occurrence of Cerebral Hemorrhage. James W. Russell.
13 Ovarian Ligament and Its Relation to Pregnancy Occurring After Ablation of the Ovaries. John H. Dauber.
14 Case of Septate Uterus and Vagina; Pregnancy in the Right Half; Delivery. Clayton A. Lane.
15 Army Medical Organization in Bavaria. F. Howard.

10. **Etiology of Carcinoma.**—Robertson and Wade record the result of researches undertaken with a view to testing the validity of the hypotheses that carcinoma is dependent on the growth of a parasite of the same class as the *plasmodiophora brassicæ*, which is known to cause tumor growths in various members of the cruciferæ, as well as in other plants. They succeeded in demonstrating the presence in carcinomatous tumors of bodies corresponding in form and in reaction to a special method to fourteen phases in the developmental cycle of the plasmodiophora and in growing from such tumors an organism which accurately represents several successive phases of a parasite of this class. They used for their investigation chiefly carcinomatous tumors of the breast and malignant adenomata of the intestine removed at operation. The bodies in carcinomata, which they believe to be plasmodiophoræ, are considerably smaller than the *plasmodiophora brassicæ*. Both show a considerable range of size in all their stages and it is therefore somewhat difficult to estimate their average relative dimensions. Bodies accurately corresponding in reaction and forms to the resting spore of

the *plasmodiophora brassicæ* may be observed lying between the epithelial cells, among the connective tissues in the glandular spaces of adenomata, and occasionally within the nucleus or protoplasm of the epithelial cells. All the various phases in the developmental cycle of a plasmodiophora were observed by the authors and they succeeded in growing the organism from carcinomatous tumors. The technic of obtaining these cultures, as well as the morphology of the organism, are described in detail and, therefore, can be obtained from the original article. The authors have traced what they consider to be three parallel lines—namely, those of (1) the life-cycle of the *plasmodiophora brassicæ*, (2) a series of bodies found especially within the cells of carcinomatous tumors, and (3) the stages of an organism which can be grown from such tumors.

12. **Atmospheric Conditions and Cerebral Hemorrhage.**—A careful study of 66 fatal cases and 62 non-fatal cases of cerebral hemorrhage appears to have convinced Russell that there is a slight tendency toward the occurrence of cerebral hemorrhage on days of high atmospheric pressure and also on days of rising pressure, the former being probably the important factor. There is a very marked tendency on days of low-wind pressure, and the combination of a low-wind pressure with a high barometric pressure is the condition under which the largest number of hemorrhages took place. Apart from season, temperature in itself did not appear to exert any influence, though a small excess in the number of cases was noted on days with a rising thermometer and also with a combined rise of atmospheric pressure and temperature.

Practitioner, London.
January.

16 Treatment of Movable Kidney. Frederick Treves.
17 *Zomotherapy in Pulmonary Tuberculosis. R. W. Philip.
18 *Diet in Pulmonary Tuberculosis. F. W. Burton Fanning.
19 Principles of the Dietetic Treatment of Tuberculosis. Arthur Latham.
20 *Parasites of Smallpox, Vaccinia and Varicella. W. E. de Korté.
21 Gastroenterostomy. Donald Armour.
22 Anesthesia in Operations on the Upper Air Passages. From the Operator's Point of View. St. Clair Thomson. From the Anesthetists Point of View. D. W. Buxton.
23 Some Points in the Surgical Treatment of Intestinal Obstruction. T. Carwardine.
24 Famous Hospitals and Medical Schools—St. Bartholomew's Hospital.

17. **Zomotherapy in Pulmonary Tuberculosis.**—For fifteen years Philip has been an ardent advocate of the systematic, continued administration of raw meat in the treatment of pulmonary tuberculosis. The form and dosage must be regulated in the way in which we regulate the administration of any drug. The method is applicable not only to tuberculosis but to a variety of wasting conditions, in gastrointestinal disturbances and generally in cases where for some reason the nitrogen output is, or has been, unduly increased, or where the nitrogen intake on ordinary diet is insufficient for the needs of the patient. The raw meat is administered as follows: 1. Finely minced or bruised beef slightly seasoned with salt, etc., according to taste, served cold or gently warmed throughout, one-half pound two or three times daily. The meat must be perfectly fresh. 2. Beef-juice prepared as follows: Extract one-half pound of meat in one-half pint of cold water plus one-half teaspoonful of salt, slowly heat to 100 F. Express the liquid through a cloth and serve. Or the juice may be expressed from the meat directly without the addition of water. In either case the meat-juice must be freshly prepared for use. 3. Raw meat soup, prepared as follows: Mix one-half pound of finely minced fresh meat with sufficient milk to produce a thick, uniform paste. Immediately before serving add one-half pint of milk at 150 F. In place of milk, the soup may be made in similar fashion with stock of beef or chicken or veal. Though not in the same dietary category, Philip also includes quite fresh raw eggs, one, two or three before meals, to be swallowed like oysters. He has not found it difficult to accustom the patient to the use and even to the enjoyment of these raw products. The method is most serviceable, he says, in the early stages of the disease, although equally good results have been obtained in very advanced cases. The patient's general condition, appearance, weight and muscularity improves rapidly. The effect on the circulation is striking, the pulse rate becomes less and the blood pressure improves. In some instances a highly irregular temperature gives place within a week or two to an almost uniform range about the normal level. The functions of stomach and bowel are rendered easier and more effective. The blood presents a rapid increase in hemoglobin, 10 or 20 per cent. in a few days, falling comparatively quickly if return be made to cooked meat. Within the chest, physical signs indicating present activity and disintegrative changes are gradually replaced by signs of quiescence and cicatrization. Tubercle bacilli gradually lessen in the expectoration and other discharges and assume a degenerate aspect. The only disadvantages urged against this form of treatment are (1) the natural distaste which many persons have to such raw products, and (2) the possibility of the introduction of intestinal parasites. The latter danger is not a likely one if reasonable care be taken in the selection of meat. Even if a parasite be so introduced, the harm to the patient is infinitesimal compared with the risk involved by the presence of the disease. The repugnance of the patient to this food speedily yields as soon as he is made to appreciate the fact that zomotherapy constitutes a definite and special treatment of his disease. Philip describes the results obtained to the fact that muscular tissue is that on which the tubercle bacillus seems to find greatest difficulty of implantation and development.

18. **Diet in Pulmonary Tuberculosis.**—Burton-Fanning says that the best results in the treatment of pulmonary tuberculosis are obtained by the administration of moderate amounts of food. Our object should be to secure over-assimilation rather than over-ingestion. The dietary recommended is characterized chiefly by the large amount of fat it contains. Experiments have shown that fats are peculiarly well absorbed by consumptives. The most suitable diet consists of about 120 grams of proteids, 140 grams of fats and 300 grams of carbohydrates. In the dietary for one day, meat is given in very small amounts (4 to 5 ounces) and only in the cooked form. Milk forms the principal part of the dietary. So obvious are the advantages which attend its use in consumption that we can hardly afford to omit it from the dietary.

20. **Parasites of Smallpox, Vaccinia and Varicella.**—By submitting the vesicular contents from the pox of smallpox, vaccinia and varicella to a microscopic examination as hanging-drop preparations, without any other manipulation whatsoever, de Korté found large numbers of unicellular elements, which on a warm stage showed ameboid movements. The organism is a spherical body measuring about five microns and containing a largely centrally situated nucleus, which is usually hidden by small, very refractive granules. The cytoplasm of the cell is firmly granular and often presents a reticulated appearance. In order to see these parasites, the lymph must be examined on the fifth day of the eruption or earlier. The parasite of varicella is found on the first, second and third days of the eruption. Human vaccine lymph must be gathered on the eighth or ninth day, for the parasites disappear spontaneously on the tenth day. In favor of these elements being protozoan is the fact that they could be grown in pure culture on a suitable medium. De Korté promises to add to this preliminary note later.

Semaine Médicale, Paris.

25 (XXV, No. 3, January 18.) *L'intervention chirurgicale dans le rhumatisme déformant. F. Lejars (Paris).
26 (No. 4.) *La maladie de Mikulicz. L. Cheinisse (Paris).
27 L'uréthrite staphylococcique par coit "ab ore."
28 (No. 5.) *Des amusies (amusia). G. Marinesco.
29 Le Phlegmon ligneux (woody). F. Lejars.

25. **Surgical Treatment of Arthritis Deformans.**—Operative treatment is not the routine technic for these cases, of course, but Lejars relates a number of cases from his own experience and that of others which demonstrate the incalculable benefit

sometimes obtained by operating. In a case reported surgical treatment of a flexed knee restored the ability to walk which had long been lost, the other joints being stiff and deformed, and the flexed knee rendering it impossible for the patient to balance herself at all. In the monoarticular cases, surprisingly favorable results have sometimes been attained. In one of König's cases there has been no exacerbation of the affection during the ten years since the operation; nor in nearly three years in Niehans' case; nor in Zesas' patient five years after resection of the elbow. Riedel reports the same in regard to a patient seen four years after resection of the temporo-maxillary articulation. The extensive resection evidently contributed to the extinguishment of the local process. In 24 cases of operations on various joints there was a mortality of 8.3 per cent. In 25 per cent. the functional results were poor; in 25 per cent. they were fairly good, and in 33.3 per cent. very good, with results unknown in 8.3 per cent. A recent Heidelberg thesis (Muszkat, 1904) mentions 50 per cent. permanently cured and 31.35 per cent. improved in 16 cases. In the polyarticular cases excellent results are sometimes obtained by mere section of the tendons or aponeuroses. When the bones are not too much deformed or when they are not the only obstacle to the correction of the deformity—as is easily determined by radioscopy—correction may be obtained by cutting the popliteal or other tendons. Done gently, such an operation, followed by modeling and extension, does not arouse a latent process, while the correction of the deformity works wonders for the patient, and renders conditions more favorable for ultimate repair.

26. **Mikulicz' Disease.**—Mikulicz published in 1888 an account of a case of a peculiar symmetrical tumefaction of the lachrymal and salivary glands. It did not fit into any previously known clinical picture and further experience has confirmed the assumption that it is a distinct morbid entity. Cheinisse reviews all the cases he was able to find in the literature, the list including Cutler's case recently published in this country. A number of surgeons have not hesitated to excise the tumefied glands, but Fuchs, Cutler and others have found that the affection can be controlled by prolonged use of arsenic or of iodid of iron or potassium. Hirschberg calls the affection "mumps of the lachrymal glands." Mikulicz thinks that the lachrymal infection is primary, and that the salivary glands become involved later owing to the anatomic communication between the lachrymal passages and the mucosa of the nasopharynx.

28. **Amusia.**—Marinesco's article is a complete study of what is known in regard to amusia; that is, the loss of the musical sense. The article is based on the case of a professor of instrumental music—especially of the bassoon—40 years old, with syphilitic antecedents. There are evidences of slight hemiparesis, musical agraphia, and partial motor amusia, both for vocal and instrumental music. The ability to play the bassoon is entirely lost.

Beiträge z. klin. Chirurgie, von Bruns', Tübingen.

Last indexed page 584.

30 (XLIV, No. 1.) *Beiträge zur Nierenchirurgie (surgery of kidneys). G. Delkeskamp.
31 *Ueber Lungen-Rupturen. G. Richter (Königsberg).
32 *Ueber postoperative Psychosen. F. Selberg (Berlin).
33 *Ueber primären Krebs der Leber, Gallengänge und Gallenblase (cancer in bile apparatus). E. Friedheim (Hamburg).
34 Ueber die Aetiologie der Noma. A. Hofmann (Freiburg).

30. **Surgery of the Kidneys.**—Delkeskamp analyzes the records of 105 different operations on the kidneys performed by Garré at Königsberg. Primary nephrectomy gave better results than secondary, in cases of tuberculosis of the kidneys, of which 20 are reported. There were 22 cases of malignant tumors in the kidneys, and 13 were operated on. Such tumors were found generally in adults between the ages of 40 and 50 and in children. Metastases were particularly frequent in the younger subjects. In 17 cases of pyonephrosis the mortality was 20 per cent. after nephrotomy and 33 per cent. after secondary nephrectomy, while it was zero after primary nephrectomy. The particulars of 92 operations on the kidneys are given in detail, and compared with the experiences at other clinics. The article fills nearly the entire number.

31. **Rupture of the Lung.**—A lad was run over by a wagon, causing a tear 7 cm. long in the upper lobe of one lung. Garré sutured the tear, but the lad succumbed next day with symptoms of pulmonary edema. Richter reviews the literature on the subject of rupture of the lungs, and advocates surgical intervention as the most promising treatment. Thoracotomy and suture have proved life-saving measures in cases of severe traumatic emphysema, even when there were indications of serious intrathoracic hemorrhage. He has compiled 37 cases of rupture of the lung, 23 of which terminated fatally. This is the first case in which the lung was sutured on account of rupture. The conditions are better for successful operating in case of a rupture than for a fistula, but Garré has been successful in suturing the lung in 2 cases of the latter. Suture of stab wounds of the lung has given almost invariably good results. The suture of the ruptured lung in the case reported was not undertaken until the fourth day, when the symptoms became alarming.

32. **Postoperative Mental Disturbances.**—Selberg has observed 7 cases of psychosis developing after an aseptic operation and one after evacuation of an appendiceal abscess. All but one of the patients had a history which indicated a nervous predisposition. The tendency to suicide in these postoperative psychoses renders close surveillance indispensable. In one instance the patient's physical condition apparently rendered suicide an impossibility, and yet he accomplished it. Selberg warns against operating on persons predisposed to a psychosis, and advises deferring intervention until conditions are more promising. Such patients sometimes attribute their ills to the operation, and consequently the surgeon should bear this possibility in mind. Abundant nourishment may aid in warding off impending trouble. The characteristics of a postoperative psychosis are acute hallucinatory confusion and motor restlessness, with ideas of persecution. Fear is the prevailing emotion. Only 4 patients recovered completely, 1 requiring treatment. Another died in a sanitarium for mental affections. Two recovered from the acute stage but were left with considerable mental impairment. The prognosis of the physical affection for which the operation was undertaken is always rendered more grave by the intercurrent psychosis. The prognosis of the latter depends on whether or not it is due to physical causes or is merely an aggravation of pre-existing mental disturbance.

33. **Primary Cancer of Biliary Passages.**—Friedheim records 3 cured patients out of 25 cases of primary cancer of the biliary apparatus, in which the gall bladder was removed with the cancerous growth. The malignant disease was primary in 25 out of the 190 cases of cancer of the liver, gall bladder or biliary passages observed at the Hamburg General Hospital from 1895 to 1904. The gall bladder and biliary passages are affected with primary cancer much more frequently than the liver. In case of chronic trouble from gallstones, the possibility of cancer should always be borne in mind, and the gall bladder should be removed if the patient is at the "cancer age." It should always be removed if it shows signs of severe inflammation or of retrogressive changes.

Centralblatt f. Chirurgie, Leipsic.

Last indexed page 428.

35 (XXXII, No. 1.) Zur Sauerstoff-Chloroform-Narkose (oxygen-chloroform narcosis). Roth (Lubeck).
36 Zur Frage der "Holzphlegmone" (woody phlegmon of neck). A. Schmincke.
37 (No. 2.) *Amaurose nach Paraffino-Plastik einer Sattelnase (of saddle nose). W. Mintz (Moscow).
38 (No. 3.) *Zur Technik der Gastrostomie und Jejunostomie. Ein neues und leichtes Verfahren. J. Arce (Buenos Ayres).
39 Ueber Hedonal-Chloroform-Narkose. W. Mintz (Moscow).

37. **Blindness After Paraffin Prothesis of a Saddle Nose.**—Mintz cites Holden and Leiser's 2 cases of amaurosis after subcutaneous injection of paraffin. He then reports a case in which he had corrected a syphilitic saddle nose by injection of 1 g. paraffin at 43 degrees. The patient was a woman of

25. She returned a year later for an additional injection, as the paraffin had sunk in at one place. He injected at two points, on each side, about 1.5 cm. from the tip of the nose, about .33 gm. paraffin at 43 degrees. Three minutes later she complained of pain in the left eye, and in twenty minutes there was complete amaurosis in this eye. The course of the case suggests that thrombosis had occurred in an external nasal vein and had spread to the inferior ophthalmic. As the thrombosis extended toward the optic foramen, the blood in the central retinal vein clotted, with blindness as the result. In two months atrophy of the optic nerve was apparent. Mintz states that since then he always warns his patients of the possibility of this complication, but some insist on the injections notwithstanding his warnings.

38. **Simplified Technic of Gastrostomy.**—Arce has applied in 5 cases a mode of gastrostomy or jejunostomy which has given such satisfactory results that he thinks it deserves a place beside the more complicated procedures of the kind. The essential feature is the suturing of the seromuscular coat of the intestine or stomach to the peritoneum by button or U sutures over an area not larger than a square centimeter. The rest of the peritoneum and mesocolon is then sutured, leaving the stomach or intestine exposed only enough to insert a No. 18 Nélaton catheter. The skin is then sutured. The opening can then be made into the stomach or intestine or it can be delayed for twelve hours to permit adhesions to form. The feeding sound is inserted slanting, and is withdrawn slowly. It is better to give nourishment in small amounts and frequently, not more than from 200 to 300 cm. at a time. The autopsy of one of his cases showed that the fistula 2 cm. long, through the abdominal wall, terminated in the stomach in a minute side opening. The fluids in the stomach flow downward and do not make their way through this small opening.

Centralblatt f. Gynäkologie, Leipsic.

Last indexed page 428.

40 (XXIX, No. 1.) Ist die Symphysiotomie eine chirurgisch inkorrekte Operation? P. Zweifel.
41 Zur Frage der Elimplantation auf dem inneren Muttermunde (implantation of ovum on internal os). E. Bumm.
42 *Kongenitale Lage- und Bildungs-Anomalie der linken Niere (of left kidney). O. Orth.
43 *Zur Berechnung des "absoluten Heilungs Prozentes" in der Statistik des Uterus Karzinoms. J. Werner.
44 (No. 2.) Fall von primärem Sarkom des Beckenbindegewebes (pelvic connective tissue). D. Pulvermacher.
45 Der suboccipito-frontale Kopfumfang (circumference). J. Kocks.
46 Stypticin bei Gebärmutterblutungen. M. Freund.
47 Ueber Anämisierung und Lokal-Anästhesie. B. Müller.
48 (No. 3.) Paralyse des nicht schwangeren Uterus (non-pregnant uterus). P. Strassman.
49 Ueber Embryotomie. L. Seeligmann.
50 Prolapse and Gangrene of Enlarged End of Ureter.—Vorfall und Gangrän des erweiterten Ureter-Endes. M. Simon.

42. **Congenital Deformity of Left Kidney.**—Orth thinks that the case he describes is of interest, as it shows that congenital malposition of the left kidney can be the cause of retroflexion of the uterus and may cause abortion. He states also that displaced kidney may simulate a pelvic tumor. In this case the patient had suffered almost constantly from sacral pains of varying intensity and a feeling of pressure in the region where the kidney was found. All symptoms vanished after removal of the kidney, which was much deformed and degenerated.

43. **Cancer Statistics.**—Werner urges that cancer statistics should list the number of patients, the proportion that were operated on, the number that died primarily, and the number permanently cured (after 5 years). He mentions other points which will aid in making statistics more easily compared.

Deutsche medicinische Wochenschrift, Berlin and Leipsic.

51 (XXX, No. 53, December 29.) Zur Pathologie und Anatomie der suprapapillären Duodenal-Stenose geschwüriger Grundlage (stenosis consecutive to ulceration). Wieting and Reschad Effendi (Constantinople).
Plantar-Neuralgie, Tarsalgie, Metatarsalgie, Talalgie, Hackenschmerz.) F. Franke (Braunschweig). (Commenced in No. 52.)
52 *Prospects of Oxygen in Therapeusis.—Die Aussichten der Sauerstoff-Inhalationen nach den neuesten physiologischen Untersuchungen. E. Aron.
53 Ueber den Fussohlenschmerz und seine Behandlung. (Podalgie,
54 *Zur Technik der Radikal-Operation von Bauch-Narben- und Nabel-Hernien (postoperative and umbilical hernias). Karewski.
55 Beitrag zu den lateralen Kiemenganggeschwülsten (tumors in branchial cleft). E. Pfister (Cairo).
56 Zur hysterischen Myopie der Schulkinder (of school children). Axmann (Erfurt).
57 (XXXI, No. 1.) Wearing Out of Nerves Without Due Repair.—Die Aufbrauchkrankheiten des Nervensystems. L. Edinger (Frankfort a. M.).
58 Ueber antibakteriolytische (antagonistische) Substanzen normaler Sera. R. Pfeiffer and E. Friedberger.
59 *Behandlung des Panaritium. Riedel (Jena).
60 Bakteriologische Bemerkungen zur Heisswasser-Alkoholdesinfektion. O. Sarwey (Tübingen).
61 *Vom Radium-Gehalt der Heilquellen und Moorerden (radium in mineral waters and muds). E. H. Riesenfeld (Freiburg i. Br.).
62 Ueber Mastitis chronica scrofulosa bei Kindern. B. Müller.
63 Professional Matters.—Umschau. L. Henius (Berlin).
64 Die Gonorrhoe sonst und jetzt (then and now). E. Finger.
65 (No. 2.) *Indikationen und Methodik der Digitalistherapie. H. Eichhorst (Zurich).
66 Ueber die im Exodin (Schering) enthaltenen wirksamen ekkroprotischen Substanzen. W. Ebstein.
67 Behandlung der Netzhautablösung (detachment of retina). H. Sattler. (Commenced in No. 1.)
68 *Zur Kenntnis und Verwertung der Rolle des Lecithins bei der biologischen Wirkung der Radium- und Röntgen-Strahlen. R. Werner (Heidelberg).
69 *Ueber die Arten der nach Kopfverletzungen auftretenden Neurosen. Die traumatische Labyrinth-Neurose. Stenger.
70 Ueber Gonococcensepsis der Neonatorum. C. Brehmer.
71 Ueber die Beziehung der Rhinitis fibrinosa zur Diphtherie. L. Wolff.
72 *Fall von chronischer Phenacetin-Vergiftung (poisoning). M. Hirschfeld.
73 *Public Health Matters.—Gewerbehygienische Rundschau. E. Roth.

52. **Limits of Oxygen in Therapeutics.**—Aron doubts whether inhalation of oxygen does what we attribute to it. He thinks that in intoxication with carbonic acid gas the benefits supposed to be derived from inhalation of oxygen are illusory. He recently had occasion to observe a child with extreme cyanosis from a congenital pulmonary valve defect. Respiration was rapid and superficial. The child was given oxygen to inhale through a spirometer and the cyanosis vanished to a remarkable extent after a few deep inspirations. On suspension of the inhalation the cyanosis recurred as intensely as before. These facts would suggest that oxygen had a marked action in the case, but further tests, with ordinary air in place of the oxygen, produced exactly the same effect. The cyanosis vanished just as when the oxygen had been inhaled. The opinion is gaining ground that the blood can never be completely saturated with oxygen—the normal saturation in the arterial blood being 82 per cent. The only way to decide the question as to the efficiency of oxygen is to eliminate the changes in the mechanics of breathing. If a cyanotic or other suitable subject could be kept for a day or so in a pneumatic cabinet, supplied only with pure oxygen, then the question would be finally decided.

54. **Treatment of Postoperative and Umbilical Hernias.**—Karewski has operated on a number of patients with very extensive hernias, and the results by the technic he describes have been extremely satisfactory. He has had four years' experience with it. An incision is made entirely around the hernia, all in sound skin, and the cicatricial tissue is extirpated, sparing the peritoneum. He then incises the muscle and aponeurosis on the longitudinal axis of the hernia; this allows the hernia to be readily reduced and its opening sutured. The muscles are then utilized to make a strong cover over the site of the original incision, supplemented possibly by wire netting. In 2 of his 13 patients the hernia extended across the entire abdomen.

59. **Treatment of Panaritium.**—Riedel remarks in the course of this clinical lecture that nothing detracts more from the patient's respect for his physician than an unsuccessful operation for a felon. If the physician is not sure of his diagnosis and does not cut deeply enough, the patient is not relieved, and is liable to become embittered against the physician. The diagnosis should be made early, and the patient should be directed to the nearest surgical operating room. Riedel says that he dreads minor surgery more than major operations, as it is on an infected soil. The proper treatment

is rapid extermination of the focus of infection and free exposure of the entire infected areas. Apparently slight, circumscribed ulcerative processes in the fingers may have serious consequences. Early extirpation of even the smallest focus of infection on the fingers will prevent innumerable joint and tendon sheath suppurations later.

61. **Radioactivity of Mineral Waters and Muds.**—Riesenfeld states that the radioactivity of certain mineral waters seems to be established. Tests of six kinds of mineral muds, including fango, have failed to reveal any radioactivity in them to date.

65. **Digitalis Therapy.**—Eichhorst has perfect confidence in digitalis in only one direction—this is when the heart musculature has become enfeebled from any cause. Affections of the valves and of the myocardium entail this weakness in time, and these are the cases that respond to digitalis almost infallibly. Other causes for weakness of the heart musculature are chronic affections of the respiratory organs, the weakness of the heart in infectious diseases, general debility and intoxications, including the excessive use of tea, coffee, alcohol or tobacco, and also emotional depression. He has witnessed a number of cases in physicians, in which overwork and sorrow or worry had induced a condition suggesting serious heart disease. Two weeks of bed rest, milk diet and digitalis banished all these symptoms. Digitalis, therefore, may be regarded as the most certain means to abolish permanent weakness of the heart muscle. He doubts the efficacy of digitalis in fibrinous pneumonia, uremia, etc., except when the heart muscle is unduly weak. Another point to which he calls attention is that patients sometimes do not respond to the digitalis while, later, the desired effect is apparent. He explains this by assuming that the heart muscle has become unduly stretched, and digitalis can exert no action on it. When the muscle has subsided to its normal condition under rest, then the digitalis displays its therapeutic action. In case of threatening cyanosis and in infectious diseases he supplements the digitalis with stimulants. He does not give the digitalis to patients with weak heart until from one to three days of rest in bed and a milk diet have failed to relieve the symptoms. A patient taking digitalis should be carefully watched, especially the pulse. If the pulse drops below 60 the drug should be suspended. The digitalis, also, should be discontinued when bigeminal heart action is present; this is most frequently observed with mitral lesions. The favorable action of the digitalis generally becomes apparent first in the increased excretion of urine, better pulse, and absorption of edema. If the amount of urine increases very rapidly, delirium may be observed, even although no digitalis is being taken at the time. He ascribes this delirium to an autointoxication from absorption, as it coincides with the subsidence of the edema.

68. **Role of Lecithin in Action of Radium and X-Rays.**—Werner's extensive experiments in regard to the biologic action of radioactive lecithin have already been mentioned in these columns, page 1908 of the last volume. Lecithin exposed to the action of radium or *x*-rays changes in some way so that it is more readily decomposed, more easily attacked by autolytic ferments. The lecithin in the cells is thus destroyed, and this in turn entails the destruction of the cells. The radiochemical processes seem to be analogous to the photochemical in certain respects. Like the sensitized salts, the lecithins by the action of the rays, are made more easily destructible. Without undergoing any apparent chemical modifications, they become decomposed more rapidly when exposed to certain conditions (contact with the developer in the first case, contact with the autolytic ferments in the second). This analogy is the more striking as it has been lately proclaimed that the biologic action of light is due to the chemically active rays. Experiments with the different components of lecithin showed that none of them was the specific agent; the total lecithin was required for the process. It was further established that a radioactive lecithin lost its activity after decomposition. His experiments on animals have established the possibility of using local injection of radioactive lecithin as a substitute for exposure to radium and Röntgen rays. Large doses by intravenous or subcutaneous injection killed rabbits, but multiple small doses in loose connective tissue were not followed by any appreciable local reaction. He is convinced that this suggests the possibility that in radioactivated lecithin we may find a therapeutic factor of incalculable scope as an accumulator of the biologic action of the radium and Röntgen rays.

69. **Neuroses Consecutive to Injuries of the Head.**—Stenger emphasizes the necessity for examining the ear in every case of injury to the head in which there are any symptoms suggesting involvement of the labyrinth. An organic affection may be present, and the designation of "traumatic neurosis" is too vague.

72. **Chronic Petechiae from Phenacetin.**—Hirschfeld's patient was a young woman, inclined to be anemic and nervous, who suffered for a year or more from numerous petechiæ on the legs. The patches were painful, and ulceration developed in some of them. The pains were somewhat relieved by local applications but the trouble could not be cured. Hirschfeld noticed in a text-book a reference to the possibility of petechiæ as a symptom of drug poisoning. The patient had been in the habit of taking headache powders for her frequent migraine. As soon as the phenacetin powders were discontinued, the lesions healed and all trouble subsided. The patient, to convince herself that her affection had been due to phenacetin poisoning, surreptitiously took some more, with the result that new petechiæ and a fresh ulcer promptly developed.

73. **Literature on Public Health Matters.**—Roth reviews the various medical works that have been published in late years on industrial poisoning and matters affecting the public health in general. He mentions as an injurious trade the making of buttons from vegetable ivory, unless great care is used to have the sawdust carried away from the workmen.

Münchener medicinische Wochenschrift.

74 (LII, No. 2, January 10.) *Tuberculosis in Cold-blooded Animals.—Ueber Kaltblütertuberkulose. E. Küster.
75 *Sunlight Treatment of Laryngeal Tuberculosis.—Behandlung der Kehlkopftuberkulose mit Sonnenlicht. L. Kunwald.
76 *Ueber Anwendung von Tuberkulin-Preparaten per os. Freymuth.
77 Dependence of Food on the Heat Economy of the Body.—Ueber die Abhängigkeit der Ernährung vom Wärmehaushalt. nach Versuchen in den Tropen, im gemässigten Klima und im Hochgebirge. K. E. Ranke.
78 Die prophylaktische Anwendung der Sekalepraparate während der Geburt (ergot during delivery). F. Prusmann.
79 Adrenalin bei Gebärmutterblutungen (uterine hemorrhage). Steinschneider.
80 Röntgen-Röhre mit Vorrichtung zur therapeutischen Dosierung der Röntgen-Strahlen (technic and tube). A. Köhler.
81 Eine retro-aurikulare Verbandklappe (cap dressing). Hecht.
82 Turbanverband (turban dressing). C. Philip.
83 (No. 3.) Beitrag zur Frage der agglutinierenden Eigenschaften des Serums Typhuskranker auf Paratyphus und verwandte Bakterien. Rolly.
84 Zur Typhusdiagnose mittelst des Typhusdiagnostikums von Ficker. H. Selter. Ibid. G. Flatau. Ibid. in Tropics. F. Eichler.
85 Ueber das angebliche "innere Disinfektionsmittel" Griserin. Th. Deneke.
86 Ein schwerer Fall von Tetanus (recovery). S. Rottenstein.
87 *Zur Pathologie und Therapie der Salpingitis chronica. A. Theilhaber. (Concluded.)

74. **Tuberculosis in Cold-Blooded Animals.**—Küster comments on the rarity of spontaneous tuberculosis in cold-blooded animals, Dubard's carp and Friedmann's turtle being the only instances known to date. He examined 200 frogs from various parts of Germany and upper Italy, and 50 other cold-blooded animals, and found evidences of spontaneous tuberculosis in 3 frogs. Cultures from the bacillus isolated from these animals were injected into other animals and the results observed confirm those obtained by Moeller and Friedmann, namely, that in the use of tubercle bacilli from cold-blooded animals we have made decided progress toward the realization of active immunization against tuberculosis.

75. **Treatment of Laryngeal Tuberculosis with Sunlight.**—Sorgo's preliminary communication on this subject has been mentioned in these columns. An ordinary hand glass is

mounted on a wooden standard in such a way that, as the patient sits with his back to the sun, the light is reflected from the mirror into his throat. He holds a laryngeal mirror in his hand and controls his position by the view he obtains of his throat in the hand glass. Sorgo is the physician in chief at the Alland sanatorium, and has applied this sun treatment of laryngeal tuberculosis in 14 cases. The results have surpassed all expectations. Essential improvement was obtained in every case. The best results were apparent in tumor-like infiltration of the laryngeal mucosa, while diffuse red infiltration of the vocal cords yielded more slowly. The difference between the response of these two forms was most marked when both coexisted in the throat. The specific action of the sunlight was particularly apparent in 2 cases in which the patients, from lack of skill, failed to expose more than a certain part of the vocal cords. The exposed area showed marked improvement, while a sharp line divided the improved, exposed area from the unexposed and unimproved part. When the subjects learned to reflect the sunlight properly, the entire lesion retrogressed. In one of these cases a course of tuberculin injections was commenced at the same time as the sunlight treatment. The infiltration and hyperemia of the vocal cords entirely retrogressed, and the pulmonary affection of the third degree showed progressive improvement under this combined treatment. The moral effect of this sunlight treatment on the patients is good. They see the infiltration subsiding, and, although the voice may still be hoarse, yet they know they are improving. The exposures were from a few minutes to an hour long, according to the strength of the patients. They soon acquired the knack of this autolaryngoscopy. The number of exposures ranged from 6 to 44, during from two to nearly six months.

76. **Tuberculin by the Mouth.**—Freymuth relates personal experiences with tuberculin administered by the mouth in the clinic. They demonstrate that tuberculin administered in this way is effectual, but only on condition that the action of the gastric juice be excluded. The effect is more uncertain and weaker than when it is injected subcutaneously. Even with these restrictions, it allows the disagreeable subcutaneous injection to be dispensed with in many cases, and in others reduces the number of diagnostic injections. Seventy-nine patients were tested by the mouth and 35 were controlled with an injection afterward. It was found that 75 per cent. of 15 who responded negatively to tuberculin per os, also gave a negative response to subcutaneous injection; the other 5 gave merely a slight reaction.

87. **Treatment of Chronic Salpingitis.**—Theilhaber has recently examined all but 1 of 23 women operated on for this trouble. When the inflamed tube was small and had thick walls, he generally removed it through the vagina as the technic is simple and the ovaries usually heal after removal of the focus. He draws the end of the tube down into the vagina after detaching the bladder. The end of the tube is held with forceps and a small lengthwise incision made. Any pus escaping flows into the vagina, and is rinsed out and wiped away. The tube is then drawn down a little farther, evacuated and the pus rinsed away. This is all done a half an inch at a time, after a large compress has been worked in above the tube to prevent any escape of pus in that direction. In 20 cases there was no reaction on the part of the peritoneum. In 7 cases both tubes, but not the ovaries, were removed, and in 2, the ovaries had been removed with the tubes. The uterus was left intact in all but one instance. The changes in the ovaries seem to be generally secondary, as likewise the peritonitis which had been of frequent recurrence in his cases previous to operation. None of the patients has had any symptoms of peritonitis since.

Grèce Médicale, Syra, Greece.

Last indexed page 510.

88 (V, Nos. 13-14.) *Naked Sponge-fishers' Disease.—La maladie des plongeurs nus d'éponges. S. G. Zervos.
89 (Nos. 15-16.) Study of 75 Cases of Malta Fever.—De la fièvre de Malte. S. Zographides.
90 *Buttermilk in Infant Feeding.—Nutrition de l'enfant par le lait acidulé dégraissé. J. Kardamatis.
91 (No. 27.) Alcoholism in Greece.—Des affections alcooliques en Grèce. Katsaras.
92 (Nos. 18-20.) Relations Between Malaria and Malignant Tumors.—Paludisme et les tumeurs malignes. Zaimis and Boreal.
93 Des abcès sous-diaphragmatiques. M. Geroulanos and G. S. Papadakis.
94 (Nos. 19-20.) Relations Between Malaria and Pregnancy, the Puerperium, etc.—Rapports du paludisme avec la grossesse, l'accouchement et ses suites et vice versa. J. P. Cardamatis (Athens).
95 (Nos. 21-22.) Sur 25 cas d'intervention chirurgicale à la paralysie des nerfs périphériques. G. Geroulanos.
96 Inflammation of Omentum Consecutive to Herniotomy.—Epiploite par suite de traitement radical de la hernie inguinale. A. Psaltof (Smyrna).

88. **Sponge-Fishers' Disease.**—Zervos remarks that the sponge fishers who ply their trade naked dread this disease, which he describes, as worse than the plague. It is frequent among them, but he knows of no description of it that has been published in the literature. It is caused by the poisonous secretion of a parasite of the sponge, the *Sagarsia rosea*. He gives an illustration of this variety of sea anemone, and describes the serious gangrenous lesion which it induces. He was able to reproduce the affection on dogs by rubbing one of the parasites against a shaved part of their abdomen. The skin became very red at once, and in a few minutes blisters developed all over the surface. Multiple abscesses followed in a few days; they discharged the sixth day, and by the eighth day a round patch of gangrene developed. The affection in one of his patients caused the sloughing off of the entire skin of the penis, leaving the corpora cavernosa and the urethra intact. The prognosis is not grave unless some vital organ should be affected by the gangrene. The fishers treat it with hot irrigations, but he believes that immediate wet cupping would be more effectual in removing the virus.

90. **Buttermilk in Infant Feeding.**—Kardamatis relates that buttermilk was used by the ancient Greeks for infant feeding. With the addition of rice-flour and a little sugar he has found it extremely useful in acute and chronic dyspeptic conditions in infants. His experience includes 23 cases and Malandrinos' 40. They found it of no benefit in acute gastrointestinal infections, but under other conditions they rank it high for artificial feeding of infants.

Riforma Medica, Palermo and Naples.

Last indexed page 334.

97 (XX, No. 46, November 16.) *Contributo allo studio delle cirrosi tubercolari. G. Vincenzo.
98 *Sulla valutazione quantitativa degli essudati pleurici mediante il metodo cromometrico Niciot-Achard. O. Schifone.
99 (No. 47.) Del metodo di Partisch nelle cisti dei mascellari (cysts on jaw). S. Ottaviano.
100 Tabe sensitiva e trofica. D. Pirrone. (Commenced in No. 46.)
101 (No. 48.) *I nostri risultati nella sieroterapia della sifilide. A. Risso and A. Cipollina.
102 *Sul valore e sulla tecnica dei metodi Ficker e Asakawa col typhus diagnosticum. L. Borelli.
103 Operative Cure of Hernia in Diaphragm.—Sopra un caso raro di ernia diaframmatica congenita. A. Albanese.
104 (No. 49.) *Test for Hyperchlorhydria.—Sopra una reazione atta a dimostrare un eccesso di HCl nel succo gastrico. A. Cipollina.
105 Influenza dei fermenti solubili sulla digeribilita del latte di vacca (on digestibility of cow's milk). V. Trischitta.
106 *New Elective Stain for Spores.—Su un nuovo metodo di colorazione elettiva delle spore. G. Scagliosi.
107 Vascular Tumors.—Peritelioma della coscia. Contributo istogenetico e clinico. F. Bindi.
108 *Artropatie e cardiopatie. F. Sarcinelli.

97. **Tuberculous Cirrhosis of Liver.**—Vincenzo draws the clinical picture of this affection from study of the literature and a personal case observed. The tuberculous infection acts on the liver as on the lung, sometimes inducing ulcerative lesions and sometimes merely sclerosis. In his patient there had evidently been a slow circumscribed chronic process; the liver was enlarged, hard and sclerotic. As this circumscribed process began to spread, an acute process developed, a parenchymatous reaction with fatty degeneration and atrophy. This assumption corresponds in every particular to the symptoms exhibited by the patient and the anatomic findings. The latter indicated a chronic tuberculous affection of the pleura, with recent invasion of the peritoneum, as the liver diminished in size. The liver lesions may be due to the bacilli or to their toxins in such cases, and hence the finding of the bacillus is not necessary to prove their tuberculous origin.

98. **Quantitative Determination of Amount of Pleural Effusions.**—Achard has simplified Nicolot's original quantitative test for pleural effusions, and Schifone has been trying it in the clinic. His conclusions are extremely favorable, and he recommends this test as eminently simple, rapid and easy while it is accurate and reliable enough for all practical purposes. The principle of the test is the injection of a stain into the pleura after withdrawal of a small amount of the fluid. The patient then bends over and backward, etc., to ensure that the stain spreads evenly through the effusion in the pleura. A small amount is then withdrawn and the tint compared with the mother stain. The particulars of 7 cases are given in detail in which the test was applied and the findings compared with the further history of the case. Achard's technic includes the aspiration of about 30 c.c. of the pleural effusion and, without removing the needle, injecting 1 c.c. of a 2.5 per cent. solution of methylene blue. The same amount of the same solution of the blue is then added to a liter of water, which thus contains the same amount of the stain as is now in the pleural cavity. About 30 c.c. of the effusion is then withdrawn and the tint is compared. Four tablespoonfuls of water are then put in two glasses. A teaspoonful of the mother solution is then added to one glass, and a teaspoonful of the fluid obtained by the first aspiration. In the other glass, a teaspoonful of the fluid obtained by the second aspiration is added to the water and also a teaspoonful of clear water. The two glasses then contain equal amounts of water and of pleural effusion—the amount of the stain is the only variable quantity. If the tints in each are alike, then the pleural effusion amounts exactly to one liter. If the tint is lighter in the second glass, then the effusion amounts to more than one liter; if darker, then it is less than a liter. By adding more teaspoonfuls of the stain it is possible to measure the exact amount. A good control test is to compare two test tubes containing each equal amounts of the pleural fluid before and after staining. A 1 per 10,000 solution of methylene blue is then dropped, a drop at a time, into the first test tube, comparing the tint with that of the stained pleural effusion, until the tints are alike in each. The exact amount of the effusion can thus be calculated by a simple formula.

101. **Serum Treatment of Syphilides.**—Risso and Cipollina review the history of serum treatment of syphilis, from Feulard, Tommasoli and Kollmann to Mazza's attempts to render guinea-pigs immune by inoculating them with serum from syphilitic blood, and the later work in this line. They then describe their own experiences which have given much more favorable results than any others previously published. They administered their specific immune serum, obtained by inoculating dogs with blood from syphilitics, not merely the serum. Sixteen patients have been treated with this curative serum. Fourteen were in the secondary stage and specific treatment had not been commenced. Two were in the tertiary stage. Nine of the 14 in the secondary stage were promptly cured, 2 left before the course was completed, and 3 are still under treatment. One of the 2 patients in the tertiary stage was completely cured, and the other is still under treatment. All the patients displayed marked improvement. The papular and the macular manifestations vanished more rapidly than under ordinary mercurial treatment. Even the lesions on the mucous membrane healed without the necessity for local treatment. A tendency to recurrence was noted in 2 cases, but it was soon dispelled by return to the serum. Specially interesting was the subsidence of a gummy tumor in the nose under the influence of a dozen injections of the serum. The 4 patients still under treatment already display great improvement. The writers are convinced that the serum has an unmmistakable active action on the manifestations of syphilis. It is probably specific, but may act merely by stimulating the natural defenses of the organism. Their results testify that it is not impossible to obtain an effectual serum from animals refractory to syphilis. It is possible that animals can be syphilized after all, although the manifestations may not be like those of human syphilis. The first injections were made in June, 1904, the inoculation of the dogs was commenced in May. Blood from syphilitics in the secondary stage, who had not yet been submitted to specific treatment, was injected under the skin and into the peritoneum of the animals. The injections were repeated three or four times with an interval of five or six days. A week after the last injection their blood was drawn for the therapeutic injections. The contagiousness of the blood of syphilitics in the secondary stage is evidence that it must contain more or less of the specific virus. The animals were inoculated with some of the formed elements of the blood in a hemolytic solution along with the serum, hoping that they would enhance the action of the serum. This hope was sustained by the fact that when too large a proportion of the dissolved corpuscles was added to the fluid injected, symptoms of irritation were noted. The particulars of the various cases are given in detail; from 2 to 5 c.c. of the animal serum was injected into a muscle every day, or at longer intervals. A glycerin-aqueous extract of the spleen and liver from animals that had been repeatedly inoculated with the blood from syphilitics was also tested. The experiments in this line are not yet sufficiently advanced for any report.

102. **Serum Diagnosis of Typhoid by Latest Technics.**—Borelli has been testing, among other things, Asakawa's method of freezing the serum for the agglutination test. He finds that it is extremely simple and easy, and materially shortens the time required for the test. The serum or blood dried on blotting paper is mixed with the emulsion of typhoid bacilli, and the test tube is placed in a freezing mixture. As soon as it is frozen it is taken out and allowed to thaw. As it thaws, the agglutinated clumps can be seen in the fluid. The entire procedure is complete in a very few minutes. The agglutination by this freezing method is specific, but it is not quite so sensitive as the original Widal. It will be found very useful when rapid work is desired. The reaction is equally marked under the microscope whether fresh or dried blood or serum is used, but for macroscopic examination, only the serum and blood dried on blotting paper respond effectually.

104. **Test for Hyperchlorhydria.**—Cippolina has found that the tint of a fluid containing "anilin water" and sodium hypochlorite varies remarkably under the influence of different amounts of hydrochloric acid added to it. The proportions should be .5 c.c. of the anilin water; 2 c.c. of the aqueous solution of hydrochloric acid or gastric juice, and four or five drops of a titrated solution of sodium hypochlorite. The color turns to amethyst and the fluid remains clear if the proportion of hydrochloric acid is 2 per 1,000; if less than 2 per 1,000, the color is purple and the fluid become turbid, while the tint is a very dark violet if there is less than .25 per 1,000. Certain other acids affect the color in the same way, but as these acids are in much smaller proportions in the gastric juice than the hydrochloric acid, they do not disturb the diagnosis of hyperchlorhydria or of hypochlorhydria.

106. **Elective Stain for Spores.**—Seagliosi's method consists in fixation of the material in van Gehuchten's or Hermann's fluid; drying in the air; staining with Ziehl's fuchsin; rinsing and counterstaining with an aqueous solution of methylene blue. The contrast staining is particularly fine by this simple method. The material at first is left in contact with the fixation fluid for thirty minutes (van Gehuchten's) or fifteen minutes (Hermann's). It is then allowed to evaporate.

108. **Heart Complications of Articular Rheumatism.**—Sarcinelli denies that heart complications are so common as generally accepted, and asserts that in many cases the heart lesions are probable primary. When the heart complications do occur it is generally in connection with the subacute or chronic forms of articular rheumatism. The heart lesion may be acute, subacute or chronic; the subjective symptoms frequently do not harmonize with the objective findings. This is due to the varying manner in which the heart in different subjects responds to functional stimuli. On this account treatment should be individualized.